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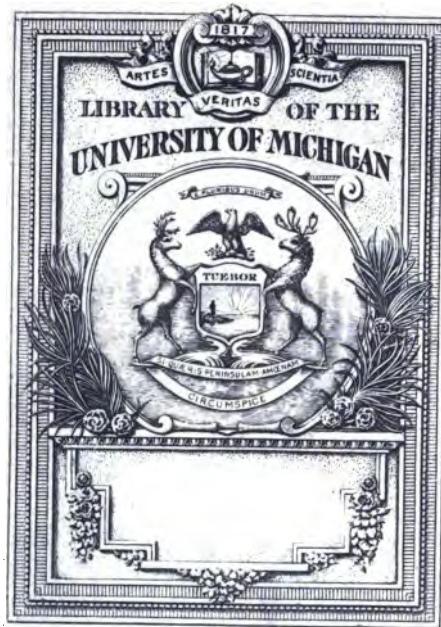
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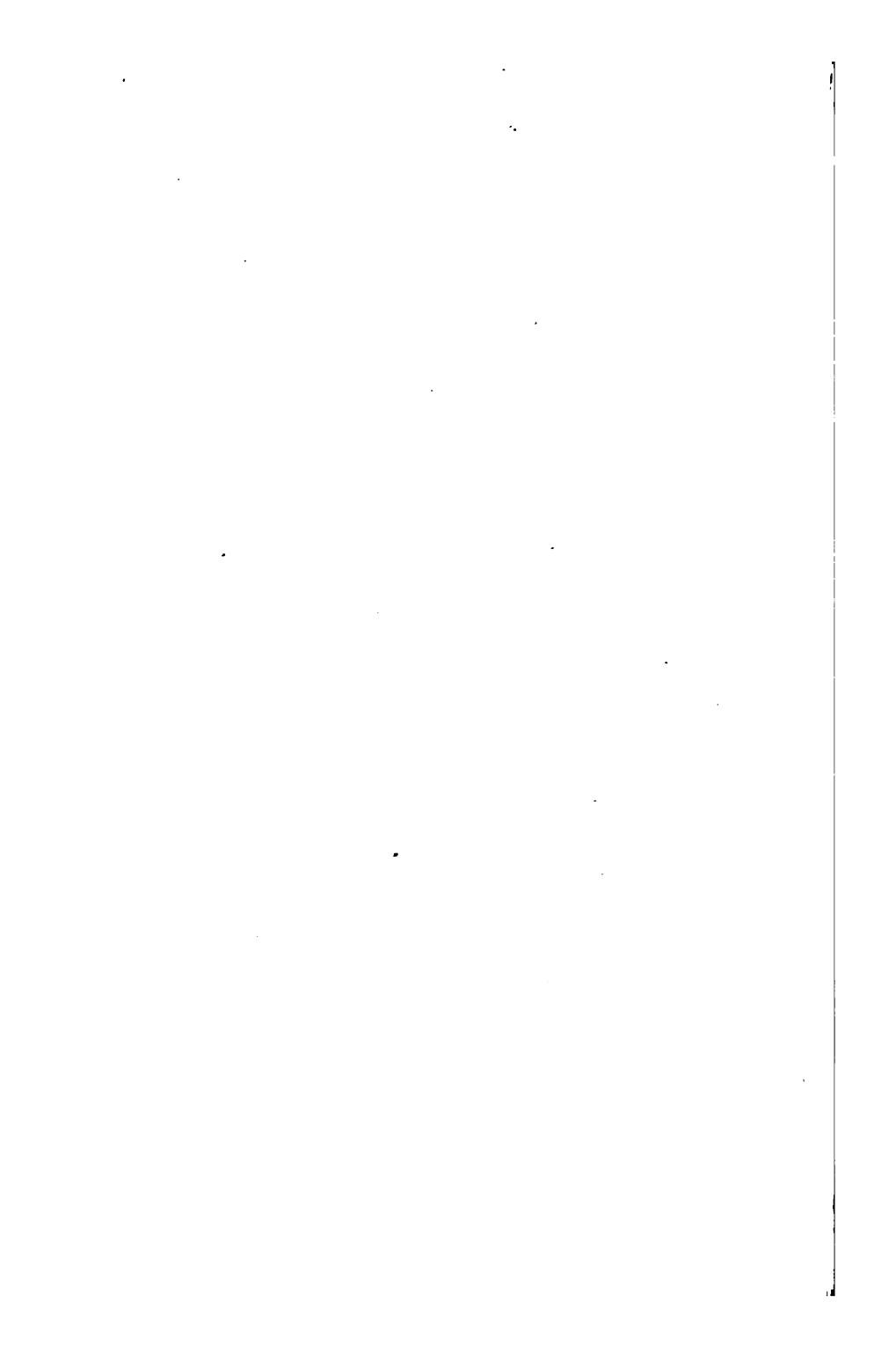
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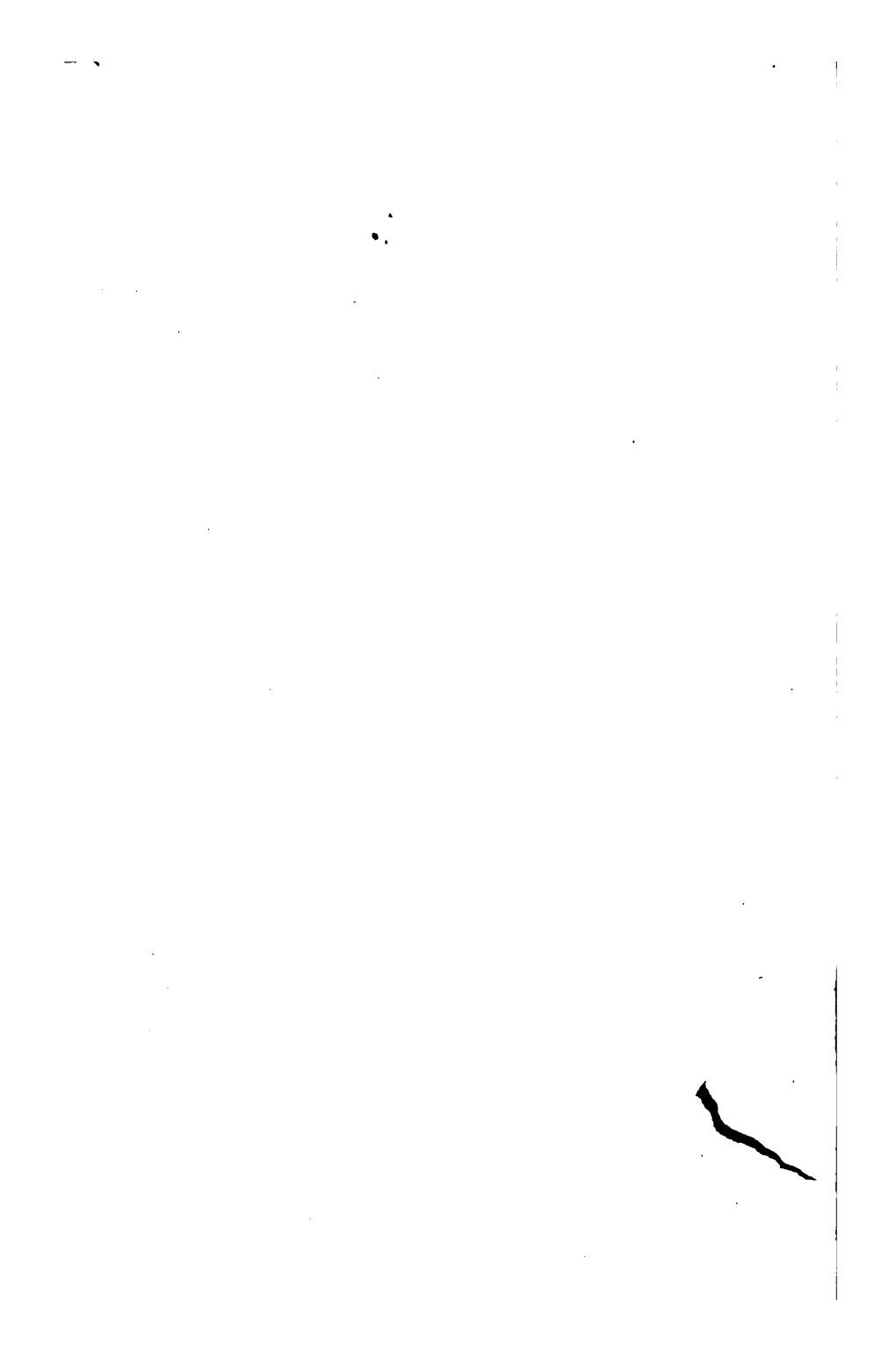


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ANTHROPOLOGICAL STUDIES.

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ANTHROPOLOGICAL STUDIES.

BY
A. W² BUCKLAND,

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NATURAL HISTORY AND ANTIQUARIAN SOCIETY.

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PRESIDENT, VICE-PRESIDENTS, AND COUNCIL
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GREAT BRITAIN AND IRELAND
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THIS VOLUME.

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P R E F A C E .

THE following pages consist chiefly of a series of essays, contributed at various times to the *Westminster Review* and the *Journal of the Anthropological Institute*, revised and corrected, and with much original matter added in accordance with the latest utterances of men of science.

Whatever shortcomings may be discovered in the volume must be attributed to want of skill in the writer rather than to lack of interest in the subject matters treated, which, being selected from what may be looked upon as the romance of Anthropology, cannot fail to attract readers who have any taste for the prehistoric development of the human race, as illustrated not only by the discoveries of archæologists in the graves of long-forgotten races; but also by the manners and customs of the savages of to-day, who may be held to continue the slow march of the ancient world, in the rear of the whirl and confusion of the army of modern progressionists.

The crowded audiences which always assemble in the Anthropological Section, at the meetings of the British

Association, seem to prove that Anthropology, which has never had as large a number of disciples in Great Britain as in other European countries and in America, would become a popular study here also if better understood. My object, therefore, in the present volume has been so to popularize my subjects as to attract my readers to study for themselves those deeper works from which I have culled the facts I have brought together, and from which I have drawn my own conclusions, not always in accord with those of the authors I have quoted, but which I would yet fain hope may be found by my critics to be neither puerile nor unreasonable. "Truth," says the proverb, "lies at the bottom of a well," and it is only by stirring up the waters of controversy that the goddess may be brought to the surface.

The quaint tales and legends, the archaic monuments, the weapons, implements, and works of art, which appear alike, and yet unlike, in so many widely-separated countries, and among diverse races, I look upon as the scattered fossils of Anthropology, from which may be built up some of the unknown histories of the human race, even as the solitary Moa bone served in the hand of the skilful comparative anatomist to build up that extinct bird of New Zealand. Whether I have succeeded in unearthing and placing in position any of these buried fossils so as to add in any appreciable degree to the skeleton of the unknown man of pre-historic times

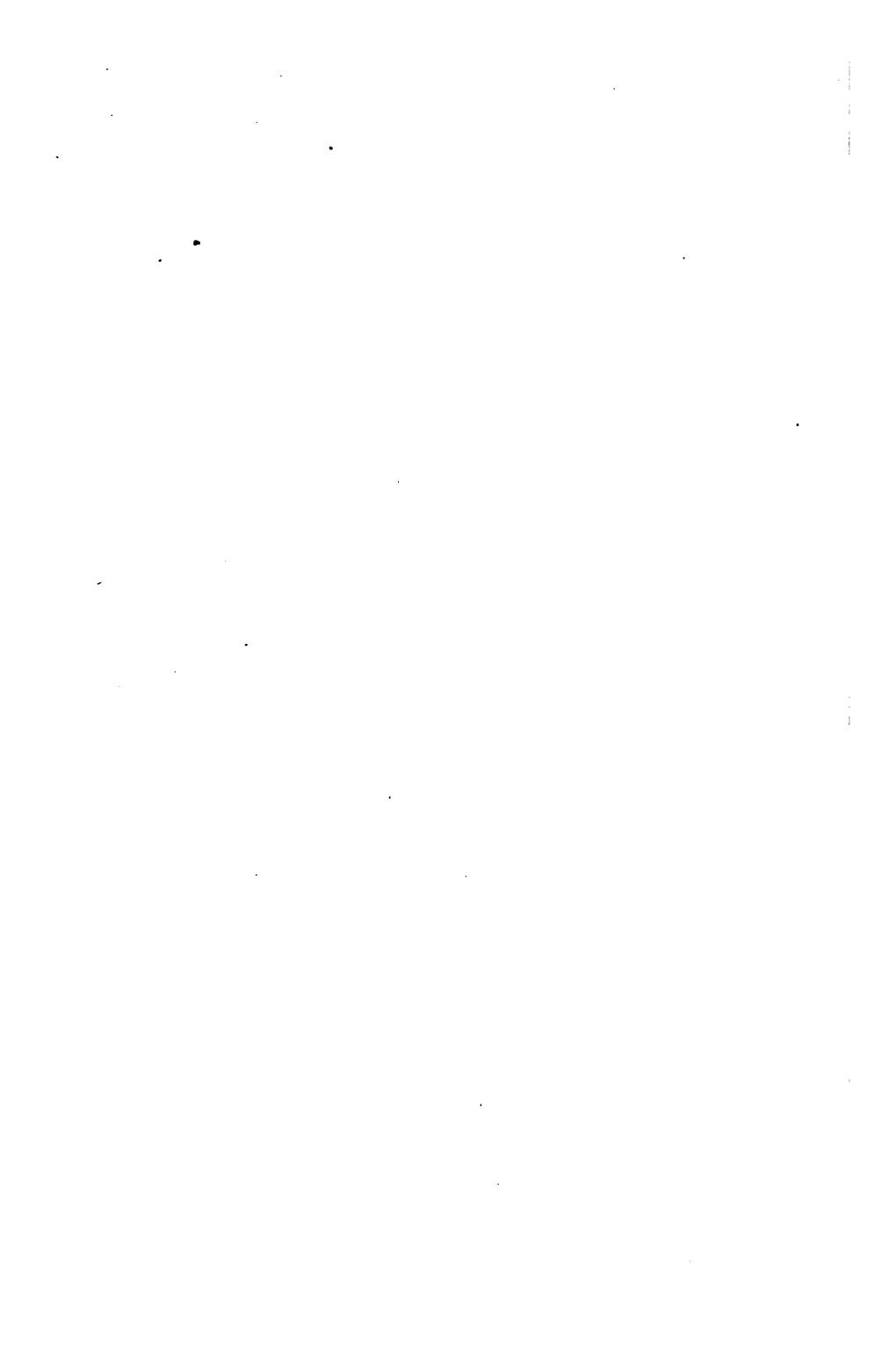
I must leave to the judgment of my readers. There are, however, numerous anthropological fossils of great importance which I have not ventured to touch. From some of these, chiefly linguistic, has been built up the theory which is at present occupying so much attention as to the original home of the Aryans, a theory which has received the qualified support of Professor Huxley, in his able article on "The Aryan Question and Prehistoric Man," in the *Nineteenth Century* for November. Canon Isaac Taylor's book on the subject is so full of interest, and so accessible, that I do not feel myself called upon to enter upon a subject which can only be properly treated by professed philologists.

I have also omitted all detailed account of the distinctions of race as regards admeasurements of the skull and various parts of the body, colour of the hair and skin of existing races, &c. &c., which although of great anthropological importance, would be out of place in the present volume.

Being anxious not to overload my text with references, I append a list of the principal works consulted, commending them to the thoughtful perusal of all whom I may succeed in interesting in the subjects here introduced to their notice.

A. W. BUCKLAND.

London, 1890.



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(Fourth Annual Report, Bureau of Ethnology, 1882-83, Smithsonian Institution.)
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(First Annual Report, Bureau of Ethnology, 1879-81, Smithsonian Institution.)

ANTHROPOLOGICAL STUDIES.

CHAPTER I.

THE BIRTH OF ANTHROPOLOGY.

Anthropology—The Science of Man—Definition—Owes its Birth to Geology—Pre-scientific Geology—Freaks of Nature—Germs of Science among the Ancients—Lucretius—The Fortuitous Concourse of Atoms—The vast Periods of Geology foreshadowed in Oriental Fables—Struggles between Faith and Reason.

NOTWITHSTANDING the progress made in scientific knowledge, there are yet many, even among the highly educated and intellectual, who know nothing of anthropology except the name, and who if asked to define the term would assert that it had something to do with old bones, flints, and rubbish. Such men would be astonished at the vast scope of anthropological research, as marked out by the leaders of a science young in years, but numbering among its teachers and students many of the most advanced thinkers of the day, not in Great Britain only, but throughout the world.

The answer to the question, What is anthropology? is perhaps best given in the words of one of its earliest and most enthusiastic students, the late Sir William Wilde, of Dublin, who in his opening address to the Biological Section of the British Association in Belfast (1874) defined anthropology (which was then, and for

many subsequent years, included in the Biological Section) as "The science of man; his origin, age, and distribution on our globe; his physical conformation, and his susceptibility of cultivation; his various forms of speech; his laws, habits, manners, customs, weapons, and tools; his archaic markings, as also his pictorial remains, his tombs, his ideographic and phonetic or alphabetic writing, down to his present culture in different countries, and his manufactures, arts, and degrees of intelligence in the different phases of life throughout the world."

Wide as this definition would appear to be, it hardly exhausts the list of subjects included under the term, anthropology; for the religions and superstitions, the myths and fables of widely-separated races, form an important link in tracing the origin and migrations, the commerce and early intercourse between such races. Among these numerous subjects, one or more must be of interest to almost every one, even although comparatively few may care for the archaic portion of the varied programme, as illustrated by flint tools and megalithic monuments.

To treat of anthropology in all its aspects, would be obviously impossible in a book which aims at becoming a popular treatise, nevertheless it would seem to be necessary to give something of an epitome of the more abstruse parts of the subject, in order to show some reason for the importance assigned by anthropologists to facts which would otherwise appear to be trivial.

Anthropology undoubtedly owes its birth to the still youthful science of geology. Before the truths of that science became recognized, all fossils were looked upon as strange freaks of nature. In all the older books on natural history, reference is constantly made to the curious and wonderful simulation of vegetable and animal forms, and particularly of shells and marine animals, in stone, by the hand of Nature; and we may easily imagine the bewilderment these things caused to those who could not be satisfied with explanations which their common sense ridiculed, but which they

were bound to accept as the authoritative utterances of the Church, a power they durst not question. When, however, liberty of speech and freedom of thought began to assert themselves as the prerogatives of free man, philosophers whispered their doubts, and hinted at theories, which, however crude, are yet often wonderfully full of the germs of truth as revealed by scientific research; nor have these prophetic utterances been confined to modern times, for travelling far back into the night of ages, we find in every age and in every civilized country, men who have seen visions and dreamed dreams, of things now being slowly brought into the region of reality by scientific evolution.

The difference between the philosophic dreamer of the past and the man of science of the present day, being that the former was content to rest in his own visionary belief of the origin of things, and the progression of the human race, whilst the scientist of to-day takes nothing upon trust; vague beliefs, however probable, are nothing to him, he demands *proof* of everything before asserting it as a fact, and there can be no doubt that this habit of investigation has had a marked effect upon the ever-increasing ratio of human progress, for knowledge begets knowledge, one discovery inevitably leads to another, so that if the rate of progress manifested during the present century be maintained, it is impossible to conceive what may be in store for mankind in the future.

Lucretius, when he vaguely enunciated the atomic theory, little imagined the perfection to which that theory would attain in modern times. The fortuitous concourse of atoms, of which he dreamed, is now generally accepted as the cosmic origin of the universe, the source of our solar system, and of many similar systems, past, present, and to come, scattered widely through the mighty infinity of space. So when he spoke of the motions of atoms as downward, adding—"And like rain would the atoms fall but for an inherent power, by which alone they can break the laws of Fate. At uncertain times, and at uncertain points in space, they

swerve a little from their equal poise. It is this alone that enables them to combine"—he was ignorant of the great and universal law of gravitation, and its power in causing the combination of atoms, and the formation of worlds; nor did he ever dream of the past history of the universe as revealed by astronomy and geology, the vast nebulous mass of uncombined atoms gradually accumulating and condensing, gradually combining and shaping themselves into a sun, with all its attendant planets and satellites, comets and aerolites, the planets gradually cooling and shrinking till vapour became water, and a fiery molten mass crystallized into rocks, this cooling and shrinking process continuing until at length after—who can tell how many ages! the earth became fitted for living organisms; these, low and imperfect at first, slowly rising in the scale of being till man appears—the grandest and latest work of creation, say the orthodox—the crowning point of development up to this present, say the disciples of Darwin; but it may be to be superseded hereafter by a still higher and more perfect form. Yet Lucretius, with his infinity of atoms in perpetual motion with unspeakable velocity (through infinite time and space), seems to have anticipated the facts of modern scientific research. So likewise, when at the beginning of the present century men began to study with interest the monuments and written histories of Eastern nations, and found in them records carrying back history to a remote past beyond the days of Noah and of Adam, according to Usher; the scholar, just learning his alphabet, smiled contemptuously from the height of his superior knowledge upon the fables of these benighted heathens, and treated the cycles of Egypt, the astronomical records of China and Chaldæa, the Yugs of India, as the inventions of a boastful and designing priesthood, anxious to enhance thereby the glories of their national history. Yet the discoveries of modern science in geology, astronomy, and ethnology go far to prove that the traditions of these ancient peoples, however derived, after making due allowance for Oriental allegory and poetic hyperbole, are not far from the truth.

Take, for instance, the almost universal tradition of the aqueous origin of the earth, slowly rising from the ocean. Whether fished up from the depths by Mauie, or called into being by Brahma, or hatched by doves from the mundane egg in Assyria, the tradition is the same, of a period of watery chaos in which human life had no part; a time in which the gods reigned, and after an immense interval created man. Take again the vast cycles of Egyptian tradition, wherein the stars returned to their places after a circle of constant change, only to start again on their unwearied round; or look at the traditions of Babylon, respecting the monstrous forms at first created, from which sprang those we now see; and observe how closely these three traditions, held by the most civilized peoples of the ancient world, correspond with the discoveries of geologists, astronomers, and anthropologists of our own day. The early geologists, when they first began to perceive, from facts which could not be gainsaid, that the history of the earth as revealed by science was not exactly in accordance with that which theologians had taught, were perplexed exceedingly. Could it be possible that all they saw had been brought about in six thousand years? Here they found traces of ancient river-beds which had long since become dry land; there a stream had hewn for itself a channel many feet deep through solid rock; here, high up the mountain-side and many miles from the sea, were beds of sea-shells and pebbles; there, beneath the ocean, were miles of submerged forest.

At first these singular facts were accounted for as the effects of a series of mighty cataclysms, which were supposed to have rent the rocks and upheaved the mountains, and buried large tracts of land suddenly beneath the waves; and in these great convulsions of nature the deluge of Noah played an important part, for did not all this take place when "The fountains of the great deep were broken up"?

But by and by it began to be seen that this theory was untenable; that although in some cases the phenomena observed might be referred to sudden catastrophes,

yet in others, and those by far the more numerous, the traces of *gradual* change were evident, and the facts not to be accounted for by any other hypothesis; and thus by degrees it came to be acknowledged on all hands, that either the accepted date of the creation must be abandoned, or else that there had been *many* creations, of which ours was the latest.

In support of this latter theory many strange forms presented themselves to geologists; bones converted into stone by the lapse of ages—the curious freaks of nature of the pre-scientific naturalists—but recognized as undoubtedly parts of once living organisms by students of the new science, although belonging to creatures having apparently no representatives on our present earth; antediluvian they were called, and the name has remained in unscientific parlance; but it was soon perceived that although some of the types had died out, many remained but slightly modified, even to our own day, the evident progenitors of living species; and anatomical science began to discover here also a gradual progression—instead of a sudden extinction, followed by a new creation—till at last it was seen and acknowledged that there was no break in the chain of continuity; that from the *eozoon* to the stately elephant of the present day, the tide of life had flowed on unbroken and unchecked. Not that this was understood in the Darwinian sense as the effect of evolution and the survival of the fittest, but simply that the various types were found to have co-existed and overlapped each other, and not to have suddenly died out, to be superseded by a new creation. Some types indeed seemed to have run through the whole series, with only slight modifications; but this was certainly not the case with man.

Here the disciples of the ancient faith took their stand, and for a long time maintained their ground unchallenged. Man was certainly a later and a distinct creation; the earth might indeed have been preparing for him for long ages; the six days of creation might have figuratively represented six geologic periods during

which the "great whales" and "winged fowl," the "cattle and creeping thing, and beast of the earth after his kind," might have severally predominated; and it was a further proof of the wisdom and goodness of the Creator, that the larger and presumably more hurtful of these great beasts had been suffered to die out, before Adam was formed from the dust of the ground, a perfect man, endowed with faculties which raised him far above the brute creation, and taught by God Himself to use those faculties for the subjugation of all created things, in order that he might attain thereby to the highest degree of civilization, even if not from the first instructed in all wisdom, and able to impart to his posterity a perfect knowledge of all the arts and sciences possible to mankind. No trace of this highly-endowed being could be found in geologic strata; it was only in the most superficial deposits that human remains and human works could be disinterred, and he certainly had no existence in those ages when the earth was filled with strange uncouth forms, differing so widely from those of our day.

This position appeared for a long time impregnable, but lately even this has been assailed, and already it totters to its foundation, for the works of man, and—although rarely—his remains also, have been found in positions and under circumstances which cannot fail to convince the unprejudiced mind, that man has existed for countless ages; and although he may not have been contemporary with the gigantic Saurians and other fossil types now extinct, yet that he certainly did co-exist with huge mammals, which have long passed away. But before we can appreciate the evidence upon which this belief is based, we must consider the intimate connection which exists between the sciences of astronomy, geology, palæontology, and anthropology.

CHAPTER II.

ASTRONOMICAL THEORIES.

Geological Facts due to Astronomical Causes still in Operation
—The Glacial Period—Theories of Croll, Lyell, Adhemar—
Sir John Lubbock, Hopkins, and Dr. John Evans on Change
of Earth's Axis—Professor Haughton—Sir W. Thompson on
Rigidity of Earth—Semi-Tropical Plants in the Arctic Region
—Traces of Glaciation in Europe, North America, India, and
South Africa— Bearing of the Glacial Epoch upon the
Antiquity of Man.

THE changes which geology has traced in the crust of the earth are due mainly to astronomical causes which have existed through all time, and still continue to operate. The shape of our globe, at first doubtless a perfect sphere, has become modified by its varied motions in space, and the gradual flattening of the poles and shrinkage of bulk has probably caused most of the disruptions of geologic strata and changes in the distribution of land and water which can be traced throughout the geologic series.

Whether our globe has now become rigid and solid to the centre, and therefore no longer subject to the changes and vicissitudes which marked its earlier history, or whether the solid matter forms only a crust resting upon a molten sea of mineral matter in a state of incandescence, the crust remaining sufficiently elastic to allow of certain bulges due to the external attraction of planetary matter, and of occasional rents and fissures consequent upon such surface changes, remain among the unsolved problems of geological and astronomical

science,¹ as does also that singular change of climate designated as the "Glacial Period," or the "Great Ice Age," which possesses such great and peculiar interest as connected with the antiquity of man.

That the variety of climates on our globe is due to the inclination of the poles is well known, but that this inclination did not always exist is rendered probable by the researches of astronomers who find it absent in the case of the superior planets. That the change of position has caused a large ice-cap to accumulate round either pole, both on our own globe and on Mars, the planet most nearly resembling our own, we see and know; but what could have caused the great increase of this ice-cap round the north pole so as to extend far down into the continent of Europe, covering Great Britain, Scandinavia, and the northern part of the American continent with a huge sheet of ice, but leaving Siberia free; and why this phenomenon should have occurred again and again with greater or less intensity, are questions which have given rise to many theories and much ingenious speculation.

The most plausible and generally received explanation of this strange phenomenon is that given by Mr. Croll, in his book entitled *Climate and Time*, wherein by a series of elaborate computations based upon well-known astronomical facts, he proves that as a consequence of the precession of the equinoxes and the varying ellipticity of the earth's orbit, the winters of the northern hemisphere, which now occur when the earth is in perihelion, that is when *nearest* to the sun, will in course of time take place not only when in aphelion, or most *distant* from that luminary, but also when the eccentricity of the orbit is at its greatest, making a difference of thirteen and a half millions of miles in distance, and increasing the winters occurring during that epoch by many days, which, repeated from year to year during centuries, would necessarily cause an increase of cold and an accumulation of ice round the north pole, sufficient to account for the Glacial Period. Mr. Croll, in

¹ Sir Wm. Thompson believes the earth to be as rigid as steel.

calculating the eccentricity of the earth's orbit backwards for a million of years, finds two periods in which the conditions before enumerated would be favourable to the production of a glacial age. One of these occurred 800,000 years ago, and the other 200,000. Sir Charles Lyell inclined to the former period as that of the glacial age of geologists, but Sir John Lubbock prefers the latter as the most probable; because "it seems unlikely that the present fauna of Europe should have continued to exist without alteration for so long a period as 800,000 years, and the variations in the range and distribution of aquatic and terrestrial animals might have occurred in less than 200,000 years, under the great changes in climate which have taken place."¹

Seeing that geologists trace at least two glacial epochs, it is possible that both Lyell and Lubbock may be right, and that Mr. Croll's theory may be the true solution of the difficulty which geologists have hitherto found, in accounting for the alternations of heat and cold clearly traceable in the past history of the world; but other theories which have been advanced to account for this glacial period and for a universal deluge must also be glanced at. M. Adhemar, working somewhat in the same groove as Mr. Croll, whom he preceded by some years, imagined that deluges were caused by the accumulation of ice round one pole, which would in time be sufficient to cause a change in the earth's centre of gravity; and hence the sea, rushing alternately from north to south, or from south to north every 10,500 years, would cause a deluge, which would of course alter the disposition of land and water, and cause the destruction of the greater portion of the terrestrial fauna and flora at that time existent; but the records of geology are for the most part opposed to violent cataclysms, and hence the theory of M. Adhemar is not favoured by geologists; and astronomers would hardly allow of the possibility of the sudden *heeling over* of a body like the earth without occasioning more serious

¹ *Pre-historic Times*, p. 403.

consequences than an alteration in the disposition of land and water. Mr. Hopkins suggested several hypotheses to account for glacial periods, attributing them either to a variation in the intensity of solar radiation, or to the possibility that the sun in its motion through space may have recently passed from a colder into a warmer region; but Sir John Lubbock,¹ who has passed all the various hypotheses of modern writers under review, points out that these theories are untenable, because the formation of glaciers requires an *alternation of heat and cold*. Another hypothesis suggested by Mr. Hopkins, and for which he claims something approaching an ascertained fact, is an alteration in, or rather the absence of, the Gulf Stream, which, he says, would lower the January temperature of Western Europe ten degrees, while a cold current from the north would make a further difference of three or four degrees; and this, Mr. Hopkins asserts, must follow the submergence of North America. But Sir John Lubbock shows that this also would necessitate an immense time, for "if when the gravels and loess of the Somme and the Seine were being deposited, the Gulf Stream was passing up what is now the valley of the Mississippi, then it follows that the formation of the loess in that valley and its delta, an accumulation which Sir Charles Lyell has shown would require a period of about 100,000 years, would be subsequent to the excavation of the Somme valley, and to the presence of man in Western Europe."²

But the hypothesis which next to that of Mr. Croll has been received with most favour in the scientific world, is that which attributes the evidences of glaciation in Central Europe to a change in the position of the earth's axis. This solution of the grand geological problem had suggested itself to my mind many years ago; but upon its first proposition by Mr. Hopkins, or some other scientist, it was scouted as impossible, improbable, and absurd. Like many other theories, however, and some great truths, it has outlived the

¹ *Pre-historic Times.*

² *Ibid.* p. 393.

period of ridicule, and has made for itself disciples among the foremost men of science not only in Great Britain, but on the Continent. Sir John Lubbock writes on this subject as follows—

“The possibility of such a change has been denied by many astronomers. My father, the late Sir J. W. Lubbock, on the contrary, has maintained that it would necessarily follow from upheavals and depressions of the earth's surface, if only they were of sufficient magnitude. The same view has recently been taken by other mathematicians. This suggestion, however, involves immense geographical changes, and would therefore necessarily have required an enormous lapse of time.”

Dr. John Evans, in his presidential address to the Geological Section at the British Association meeting in Dublin, in 1878, spoke thus—

“The general opinion of physicists, as to the possibility of a change in the position of the earth's axis, has recently undergone modifications somewhat analogous in character to those which, in the opinion of some geologists, the position of the axis has itself undergone. Instead of a fixed dogma as to the impossibility of change, we find a divergence of mathematical opinion, and variations of the pole differing in extent, allowed by different mathematicians who have of late gone into the question, as, for instance, the Rev. J. F. Twisden, Mr. George Darwin, Professor Haughton, the Rev. E. Hill, and Sir William Thompson. All agree in the theoretical possibility of a change in the geographical position of the earth's axis of rotation being affected by a redistribution of matter on the surface, but they do not appear to be all in accord as to the extent of such changes. Mr. Twisden, for instance, arrives at the conclusion that the elevation of a belt, twenty degrees in width, such as that which I suggested in my presidential address to the Geological Society in 1876, would displace the axis by about ten miles only; while Professor Haughton maintains that the elevation of two such continents as Europe and Asia would displace it

by about sixty-nine miles; and Sir W. Thompson has not only admitted, but asserted as highly probable, that the poles may have been in ancient times very far from their present geographical position, and may have gradually shifted through ten, twenty, thirty, forty, or more degrees, without at any time any perceptible sudden disturbance of either land or water."¹

Dr. Evans then goes on to express his own opinion that the earth cannot be as solid and rigid as many suppose it to be, and that sufficient regard has not been paid to the effect of the readjustment of the large fluid area of the globe, nor to the possibility of internal as well as external changes in affecting the distribution and readjustment of matter. In truth this assumed rigidity appears to be contradicted by many well-ascertained facts. Mr. Waters, F.G.S., has calculated the changes traceable in the level of land and sea in Italy and Sicily, and estimated the movement of the pole which would result therefrom; and when we take into consideration the vast elevations and subsidences which have undoubtedly occurred, and are still slowly in progress, it appears to me impossible to doubt that the earth's axis has been gradually shifted, and is still constantly shifting, *probably* in one given direction, but *possibly* in a curve, although the yearly motion is too small to be appreciable, and this motion of the axis, added to Mr. Croll's theory, will, I believe, eventually be found to give the true cause of the so-called Great Ice Age.

It is obvious that, supposing the earth to have retained its present form from a remote period, and the poles to have gradually circulated round the world, that those places over which the poles have passed would not only have experienced a long glacial period, but would also have become more or less submerged, in consequence of the flattening of the Polar region, and more or less elevated as they again approached the equator, with a corresponding variation of climate, and one completed revolution, or it may be one completed

¹ *Proceedings of British Association*, 1878.

circle, not round the world, but round a given centre, would of necessity result in two glacial epochs, probably of varying intensity, in accordance with the eccentricity of the earth's orbit at the time. Various recent investigations seem to confirm the truth of this theory. Humboldt long ago noted the north-westerly trend of all mountain ranges, and the same has been remarked by Captain Stokes in the southern hemisphere. Linnæus saw the changes of ocean-level, and marked its encroachments by a stone, which is now 340 feet nearer to the sea.¹ In railways running north and south in America, a singular creeping of the rails southwards has been observed, the western rail always creeping faster than the eastern; and lately, which is perhaps the most significant fact of all, observations have been made at St. Petersburg which show a diminution of latitude there, and also at Greenwich, Washington, Paris, Milan, Rome, Naples, and Konigsberg. Another curious fact which has attracted much attention of late is, that recent Arctic explorations have proved uncontestedly that a mild semi-tropical climate once existed within the Arctic circle, for not only have coal and coral been found in the most northerly lands discovered, but the fossil flora of these lands is found to include plants semi-tropical in character, and which could not thrive and produce seeds with the amount of light now received in those regions, even if they could by change of habit have borne a considerable increase of cold.

The Arctic regions indeed would seem to be now passing through their first glacial epoch, for Professor Nordenskjold gives as the result of his geological observations in the Polar regions, that he has never seen in Spitzbergen or Greenland, in mountaius 1000 or 1500 feet high, sections of which are exposed quite free from snow or vegetation, any trace of boulders even as large as a child's head, in strata prior to the middle of the Tertiary, that is, in the later Miocene, although the rocks thus exposed include all formations from the

¹ *British Lyceum*, Nov. 1870.

Silurian to the Tertiary, and an extent of over one thousand miles.¹

Comparing this with the testimony of geologists as to the traces of glaciation in Europe, North America, India, and South Africa, at different epochs from Silurian to Tertiary times, it would seem more reasonable to imagine that the poles are being constantly but very slowly shifted, according to a law at present unknown, causing glacial epochs of varying extent and intensity (probably in accordance with Mr. Croll's theory) within a certain zone, but leaving portions of the earth's surface to enjoy a temperate rising to a tropical climate; rather than to suppose a glacial epoch or rather several glacial epochs, and extending to within a few degrees of the tropics in both hemispheres, and yet not reaching the north pole, which would appear at that time to have enjoyed a semi-tropical climate.²

Speculations on the Great Ice Age would seem to have little to do with anthropology; but, as will presently appear, the subject has an important bearing upon the antiquity of the human race, for it cannot be doubted that the traces of man in Britain date back to a period which, if it did not precede, certainly followed close upon, that epoch; and if we accept the theory and the chronology of Mr. Croll, the date of man's appearance in these islands, remote as it is, may thus be roughly estimated;³ but as no one has yet suggested that the *genus homo* originated in Britain, he must of necessity have been some time in existence before he found his way to these distant and at that time inhospitable

¹ Wallace's *Island Life*, p. 18.

² The theory of the shifting of the earth's axis appears to be still favoured by geologists, for Mr. Green, in his address to the Geological Section of the British Association at Leeds this year (1890), says—"At a gathering where several of our best English geologists were present, the question of the cause of changes of climate was under discussion. The explanation which found most favour was a change of the position of the axis of rotation within the earth itself."

³ Croll and Geikie assign 80,000 years as the close of the glacial epoch on astronomical grounds.

shores. We have therefore to go back still farther into the night of ages to look for his origin, whilst his birth-place will probably ever remain unknown.

Climate undoubtedly has a great effect upon the human race, both as regards his physical and mental development. Intense cold, especially when accompanied by insufficient food, dwarfs the body, and to a great extent deadens the mental faculties; but intense heat is probably much more detrimental to human progress than the opposite extreme, whilst a temperate climate, moderately cold, certainly tends to stimulate the inventive faculties. It has therefore been supposed that man *originated* in a moderately warm climate, but that *civilization* dawned in a *temperate* region, and the curious discovery above mentioned of the former existence of a semi-tropical climate within the Arctic circle has given rise to a theory that man originated at the north pole, and more than one book has been written of late to prove that the Garden of Eden was situated in that ice-clad region; but unless definite traces of man's existence can be produced from the highest latitudes, of an age undoubtedly more ancient than those which have been found in other parts of the world, this theory will be regarded by scientists as only a wild speculation.

CHAPTER III.

THE ANTIQUITY OF MAN.

The Unvarying Succession of Implements of Rough Stone (Paleolithic), Polished Stone (Neolithic), Bronze, and Iron—Age of Copper probably intervened between Neolithic and Bronze Epochs—Geologic Measure of the Ages—Paleolithic Tools in Egypt—Interesting Discovery by General Pitt-Rivers—Tools of the Drift and Cavern Periods—Exploration of Kent's Cavern by Mr. Pengelly—The French Caves—Similarity of Fauna—Man certainly cotemporary with Extinct Animals—His Pre-glacial Origin still in dispute—Difference between early and later Paleolithic Tools.

THE works of pre-historic man, wherever found, tell the same unvarying tale; first, of a very low type of humanity, content with the rudest of weapons, rough flints sharpened to a point by blows from another flint, rising gradually to the use of better and more artistically-formed weapons, polished with care; then to a knowledge of gold, silver, copper. A little later, these weapons of stone, polished or unpolished, yield to implements of bronze; and considerably later, these in their turn are replaced by those of iron, and with the latter, history dawns, and the progress of mankind is no longer conjectural.

This change and succession of weapons, always from stone to bronze, and from bronze to iron, has caused anthropologists to divide the pre-history of mankind into four ages: the first known as *Paleolithic*, in which rude weapons and implements of rough, *unpolished* stone were alone used; the second, or *Neolithic*, in which the implements were ground and polished with care; the third, or *Bronze Age*, in which polished stone was sup-

plemented by bronze for implements and weapons; and the fourth, or *Iron Age*, in which iron became the chief metal for useful purposes. There is at present a disposition to subdivide each of these periods, and to interpolate, between the Neolithic and the Bronze ages, one of Copper. In many countries,¹ and certainly in America, there was a period, although perhaps a brief one, in which implements of copper only were used; and it is certain that the vast period included in the term *Paleolithic* might be advantageously subdivided into the earlier and later.

It is these rude stone *Paleolithic* tools which supply the earliest traces of man, for they are found under circumstances that leave no room for doubt as to their vast antiquity. Sir Charles Lyell, in his celebrated work on the *Antiquity of Man*, brought all his skill as a geologist and naturalist to bear on this subject, and his deductions have been very generally adopted by later writers as practically unassailable.

Beginning with the more obvious traces of man and his works, as shown in the "kitchen-middens" or refuse heaps of Denmark, and the "lake dwellings" of Switzerland, Italy, and Ireland—which all yield certain proofs, not only of man's existence at a remote period, but of his knowledge of some of the useful arts, as the art of weaving and of making clothes, fishing-nets, and pottery, the domestication of animals, and even a knowledge of agriculture; periods which may to a certain extent be measured, not only by the internal evidence they offer, but also by the changes in their surroundings during historic times, and which he therefore designates as *recent*—he works backwards to that remote past represented by the extinct mammalia, and proves that man was contemporary with them by the juxtaposition of tools, undoubtedly of human manufacture, although rude in form; with the bones of the mammoth, gigantic elk, and other smaller species of mammalia now found only in a fossil state, embedded in caves sealed down

¹ Mr. Flinders-Petrie found implements of copper in the cities of the Fayoum recently explored by him.

with stalagmite, or in undisturbed river-gravels, the date of which can hardly be determined within thousands of years.

Evidence of this kind has been accumulating since the publication of Lyell's work, and these rude paleolithic tools have been found in many unexpected places. In India, Japan, Palestine, Babylonia, on the Cape Flats South Africa, and in the blue ground from which diamonds are extracted, on the sandy African deserts, and more interesting still, in that cradle of civilization, Egypt, where, although man is known to have been in possession of metal tools for many thousands of years, these rough chipped stone implements have been found at various depths in the sandy soil which time has converted into rock.

One of these deserves especial mention, because it was found by General Pitt-Rivers forming part of the soil out of which ancient Egyptian tombs, near Thebes, have been cut, proving that it was there *in situ* before these tombs were constructed, and that it had lain there undisturbed whilst the mud and gravel slowly formed itself into a hard conglomerate. "The whole deposit," says General Pitt-Rivers, "appears to have been washed down from the Bab-el-Molook, a tributary valley in which the tombs of the kings are situated, and to have spread itself out on the plains in a fan shape between the gorge of the valley and the Nile. Through this delta, or fan of gravel, a waddy about eighty paces mean width has cut its way to a lower level, and now extends from the gorge of the valley to the margin of the highest Nile floods, passing through the fan for a distance of nearly 2000 paces, and opening into the plain about 270 paces to the east of the Temple of Koorneh."¹

In this gravelly deposit, hardened into conglomerate, rising in places to a height of from nine to nineteen feet, which General Pitt-Rivers says could not have changed materially since Egyptian times, tombs have been cut consisting of flat-topped chambers and galleries supported by square pillars of gravel. It was in one of

¹ *Journal of the Anthropological Institute, May 1882.*

these square supporting pillars that the flint flake of which we have spoken was found, the end having been cut off in forming the entrance to the tomb. It was so firmly embedded in the rock that it had to be cut out with a chisel, and proved to be a very fine paleolithic specimen. Nor was this the only flint implement discovered in this conglomerate, for seven others were removed on the same day.

The tombs are supposed to belong to the XVIII. Dynasty, or perhaps earlier, that is, about 1500 B.C.; but the date of the formation of the gravelly conglomerate in which they were cut cannot be so easily estimated, although it seems certain that it was when the climate and rainfall of Egypt differed greatly from that known in the very earliest of historical records.

Here then we get a glimpse of the antiquity of man, for it is certain that he existed and made and used flint implements, when as yet Egypt had not assumed its present form, and long before the rise of that very ancient civilization, the origin of which is still undetermined.

Similar evidence is afforded by the gravels of Europe, in which implements of the same type are frequently found, in positions proving vast geographical changes since they were deposited. Those found in the *drift*, that is, in the gravels, sand, and loam, which formed the beds of ancient rivers, or in terraces, from which seas or rivers have gradually retreated, are regarded as the most ancient; they are generally larger and rougher than those of later date, although often very skilfully fashioned; they are found associated with bones of extinct mammalia, and carry the antiquity of man back certainly to the close of the glacial period, if not to its commencement. Many implements of the most ancient type have been found in caves sealed down by vast deposits of stalagmite. The most celebrated of these caves is that known as Kent's Hole, a cavern near Torquay, which has been most carefully and scientifically explored by Mr. Pengelly, aided by a grant from the British Association.

The history of this cave is very interesting. About sixty years ago Mr. M'Enery, a Roman Catholic priest, explored this famous cavern, and found therein bones of extinct animals, and with them flint and bone tools, evidently the work of man, and which he believed to be cotemporaneous. Nevertheless, in deference to Dr. Buckland, who two years previously had explored the Kirkdale Caves, and declared his conviction that none of the human relics found were as old as the mammoth and other extinct quadrupeds, he quietly yielded his own opinion, and allowed the matter to drop; but subsequent researches, conducted in a manner which seems to render mistakes or fraud impossible, have emphatically confirmed the opinion of the first explorer. Since the history of Kent's Cavern is almost identical with that of all the osseous caves of England, we will give a concise summary of its contents, according to the report of its able and energetic explorer, Mr. Pengelly.

There are two entrances, and the first thing to be noticed in the interior is a number of irregular blocks of limestone, which have evidently fallen from the roof, and now rest upon a black mould, from three to twelve inches thick, containing remains which are all traceable to the period of the Romans, or a little earlier—that is, representing an antiquity of about 2000 years, the animal remains also belonging exclusively to the historic period. This black mould cleared away, we find a flooring of granular stalagmite, varying in thickness from less than an inch to five feet. Beneath this stalagmite lies a black band, about four inches thick, consisting almost entirely of pieces of charred wood, and extending only for about 100 square feet near the entrance of the cavern, and supposed to represent the place in which the ancient cave-dwellers kindled their fires. Below this, again, and filling the cavern to the depth of several feet, is cave-earth of a light-red colour, in which, as also in the black band and the overlying stalagmite, have been found embedded, not only the bones of many extinct animals, the hyæna predominating, but also traces of man, in tools of bone and stone, rudely manufactured,

yet still undeniably the work of man—amongst others, a bone needle, with the eye carefully drilled, and a harpoon like those of the French caves.

Here the researches of Mr. M'Enery and of Dr. Buckland terminated, the former convinced by the remains discovered of the great antiquity of man in Britain, the latter seeking to explain, by diluvial and other catastrophes, the presence of the remains of man with those of extinct mammals, but utterly denying that they could have been cotemporaneous, asserting that the stone and bone implements must have been accidentally introduced into the cavern at a later date.

It must be noted that pottery, metal-work, spindle-whorls, and other indications of civilization, cease entirely with the granular stalagmite; that beneath it the implements found are of bone and stone only, and much ruder in form than those of the upper stratum. This was for a long time supposed to be the first chapter of the history of man; but in clearing out the cave, another stalagmitic floor presented itself, crystalline in structure, and of a thickness in some parts of almost twelve feet. This floor had been broken up in places by some unknown natural agency, before the introduction of the cave-earth, and beneath it lay a breccia of many feet in thickness; and in this breccia, as well as in the crystalline stalagmite, were found in abundance the bones of the cave bear, and almost of that *only*, although a few bones of one or two other species have been discovered. But in the midst of this breccia, buried, for who shall say how many thousands of years, beneath a flooring of stalagmite which had accumulated to the thickness of twelve feet, at the rate of less than the twentieth part of an inch in a century, have been found flint tools, much rougher, larger, and more archaic in type than those of the upper strata, yet showing most evident traces of man's handiwork. Such is the history of Kent's Cavern, as at present revealed to us by the indefatigable labour of Mr. Pengelly, and perhaps it will be well to let him speak in his own words with regard to the antiquity of these deposits.

"That the deposits, with the constructive and destructive processes described, were not only distinct and successive, but also very protracted terms in the Cavern chronology, is strikingly seen in considering the changes they indicate. 1st, During the period of the breccia (*i. e.* the lowest deposit yet known) there was a machinery capable of transporting from Lincombe or Warberry Hill, or both, or from some greater distance, fragments of dark-red grit, varying in size from pieces four inches in diameter to mere sand, and lodging them in the cavern. This so completely passed away, that nothing whatever was carried in, but the deposit already there was covered with a thick sheet of stalagmite, obtained through the solution, by acidulated water, of portions of the limestone in the heart of which the cavern lay. This stage having also ended, the stalagmite was broken up by some natural agency, the exact character of which it is difficult to ascertain, but which achieved its work, not by one effort, but by many in succession, and much of at least the breccia it covered was dislodged and carried out of the cavern. This re-excavating period having in like manner come to a close, a second deposit was introduced; but instead of consisting of dark red sand and stone, as in the former instance, it was made up of a light red clay, and in it were embedded small fragments of limestone, which, from their angularity, could not have been rolled, but were in all probability supplied by the waste of the walls and roof of the cavern itself. 2d, The paleontology of the two deposits is perhaps even more significant of physical changes and the consequent absorption of time. When the cavern-haunting habits of the hyæna are remembered, it will be seen that his entire absence from the fauna of the breccia, and his remarkable preponderance in that of the cave-earth, renders it eminently probable that he was not an occupant of Britain during the earlier period. To accept this, however—and there seems to be no escape from it—is to accept the opinion that between the eras of the breccia and of the cave-earth it had become possible for the hyæna to reach this country,

since he was actually here, and in great force. In other words, the men of the breccia, the ursine period of the cavern, saw this country an island as we see it—unless, indeed, their era was prior to this insularity—when it was also occupied by bears and lions, but not by hyænas; whilst in the time of their descendants or successors, the whole of Western Europe had been so elevated that the channel which previously and subsequently separated it from the Continent was dry, and Britain was in a continental condition.”¹

It will thus be seen, that in accordance with the indications afforded by the contents of Kent’s Cavern, Mr. Pengelly is disposed to assign to man in Britain a higher antiquity than that claimed for him by Sir Charles Lyell, who wrote before the discovery of the implements in the breccia, and to place him between the two glacial epochs, at a period when this island formed an integral part of the European continent. It is indeed evident that the huge mammals found in the caves, in the river-gravels, and in submerged forests, could never have got here had our land always been an island as at present, neither could primitive man, who, judging from the rudeness of his implements, could have had no knowledge of navigation at that early period.

Now, geologists trace two continental periods, in the first of which bears and lions reached our shores with man in a state of utter barbarism, and this period corresponds with the breccia of Kent’s Cavern, and the remains in the submerged forest of Cromer on the Norfolk coast, which is also supposed to represent a Pre-Glacial era. Then came a time of submergence, during which the crystalline stalagmite slowly formed, and the fauna received no new additions, whilst perhaps some types died out; then came a second upheaval, and the hyæna appeared and feasted on the bones of the mammoth, elk, bison, &c., whilst the works of man are characterized by an advance in art. His stone

¹ See *Report of Transactions of Plymouth Institution*, 1875, on “Flint Implements found in Kent’s Cavern,” by W. Pengelly, F.G.S.

tools are still rude and unpolished, but smaller and better formed than those of the breccia, and are supplemented by those of bone, whilst the needles found suggest the use of clothing, and a perforated tooth of badger shows that he had already begun to study the art of adorning the person. This grade of progress corresponds singularly with that found in the French caves, although as yet no works of art similar to the drawings found in the caves belonging to the reindeer period at Dordogne have been found in Britain, but as the fauna of the two countries are almost identical, as the subjoined tables will show, it is reasonable to suppose that a similar race existed in both.

KENT'S CAVERN IN CAVE-EARTH AND GRANULAR STALAGMITE (*Pengelly*).

Hyæna
Horse
Rhinoceros
Gigantic Irish Elk
Wild Bull
Bison
Red Deer
Mammoth
Badger
Cave Bear
Grizzly Bear
Brown Bear
Cave Lion
Wolf
Fox
Reindeer
Beaver
Glutton
<i>Machairodus latidens</i> ¹
Man

CAVES OF AURIGNAC, FRANCE
(*Lartet, copied by Lubbock*).

Hyæna, <i>Spelæa</i>
Horse, <i>Equus caballus</i> ²
Rhinoceros, <i>Tichorhinus</i>
Irish Elk, <i>Megaceros Hibernicus</i>
Aurochs, <i>Bison Europæus</i>
Stag, <i>Cervus elaphus</i>
Mammoth, <i>Elephas primigenius</i>
Badger, <i>Meles taxus</i>
Cave Bear, <i>Ursus spelæus</i>
Brown Bear, <i>Ursus arctos</i>
Cave Lion, <i>Felis spelæa</i>
Wolf, <i>Canis lupus</i>
Fox, <i>Canis vulpes</i>
Reindeer, <i>Cervus tarandus</i>
Polecat
Wild Cat
Boar
Man
Roe
Ass (?)

¹ The discovery in Kent's Hole of several teeth of an extinct carnivorous animal (*Machairodus latidens*), the great sabre-toothed tiger, which belongs to an earlier fauna than the other extinct mammals found in the cavern, and which has not been found elsewhere in Britain, is of especial interest.

² The enormous herds of wild horses which existed in Europe,

And not only do the fossils correspond in the two countries, but the works of man, excepting as regards pictorial art, also coincide so nearly, both in type and in chemical condition, as to make it almost certain that they were nearly, if not quite, cotemporaneous; whilst, with the exception of the mammoth, the beaver, and the reindeer, the whole fauna seems to show a climate milder than the present. If then we take this fauna to represent a Continental Period, one of *upheaval*, we are led to a conclusion contrary to that of most geologists—that the Glacial Period was one of subsidence, that as the land became elevated, so did the temperature rise also, so as to become suitable to the mammals of tropical climes, whilst the reindeer and beaver, which, it may be remarked, are few in number in English caves, may represent the vanishing fauna of a past era of Arctic cold. Whether the men of the breccia survived the Arctic Period which intervened between the two Continental Periods is not clear. Certain it is that the men of the second period, that of the Hyæna, were far more advanced than those of the earlier epoch; but whether that advancement was acquired naturally, or introduced by a new race following in the track of the great mammals, we do not know. In any case, the time required for the gradual changes in land and water between the two Continental Periods must have been enormous, to be calculated only by the astronomer; and we must not forget that the upheavals and subsidences to be traced in our own land are not isolated cases, but are still more marked in other parts of the globe, and that the causes which produced them are still in operation, that year by year

may be imagined from the fact, that at Solutré, one of the stations of the Paleolithic cave-men of France, remains of the horse are found in a broken line 100 metres long, four metres wide, and three metres deep, that the skeletons of 40,000 horses might be put together, and in proof that these were used as food by the hunters of that remote period, most of the bones have been broken for the marrow, some show traces of fire, and in one case at least a vertebra has been found pierced by a flint arrow-head.

islands, now widely separated, become infinitesimally nearer to each other by a gradual upheaval, whilst in other parts a similar rate of subsidence may be proved to have taken place.

Caves which have since been explored in other parts of England and Wales, tell precisely the same story as Kent's Hole. The latest which have been excavated under the auspices of the British Association, are two in North Wales; the animal remains found in these are almost identical with those of Kent's Hole, and need not be recapitulated, but only one tool of human workmanship was found; we will, however, give the conclusions arrived at by the explorers as to the bearing of these discoveries upon the question of the antiquity of man in Britain.

"Whether the caverns were occupied in pre- or inter-glacial times it is difficult to decide; but it is certain that they were frequented by pleistocene animals, and by man, before the characteristic glacial deposits of this area were accumulated. The local gravel found in the caverns, underlying the bone earth, must have been washed in by streams at an earlier period, probably before the excavation of the rocky floor of the valley to its present depth. From the glacial period up to the present time, excavation has taken place only in the glacial deposits, which must have filled the valley up to a level considerably above the entrances to the caverns. The characteristic red boulder clay with erratic blocks from northern sources, is found in this area to a height of about 500 feet, and sands and gravels in the mountains to the S.E. to an elevation of about 1400 feet. The natural conclusion therefore is that the caverns were occupied by an early pleistocene fauna, and by man, anterior to the great submergence indicated by the high-level marine sands, and therefore also before the deposition of the so-called great upper boulder clay of this area. As there is no evidence against such a view, it may even be legitimately assumed that the ossiferous remains and the flint implements

are of an earlier date than any glacial deposits found in this area."¹

The first attempts at cavern exploration were made in the south of France in 1828, by MM. Tournal and Christol, who, in publishing the results of their explorations, expressed the opinion that the human remains which they had found, commingled with those of extinct animals, "had certainly not been washed in by any diluvial catastrophe, but must have been introduced gradually. The presence of pottery, however, throws much doubt on the supposed antiquity of these remains."² Prior to this, caves had been ransacked for bones to be used in medicine, and in 1821 Dr. Buckland explored the Kirkdale Caves, and published his *Reliquiae Diluvianae*, but he refused to believe in the presence of man in the caves as cotemporaneous with the extinct animals whose relics he described.³ In 1831 Dr. Schmerling examined many caves in Belgium, and obtained from them results agreeing with those of the French explorers—that is, rude flint and bone implements, and portions of human skeletons mixed with bones of extinct mammalia, which certainly, within the historic period, had not been known in Europe. Nevertheless, the discoveries of Schmerling were discredited, even by such men as Sir Charles Lyell and Dr. Buckland. The former says—"After giving no small weight to the arguments of M. Desnoyers, and to the writings of Dr. Buckland on the same subject, and visiting myself several caves in Germany, I came to the opinion that the human bones, mixed with those of extinct animals, in osseous breccias and cavern mud, in different parts of Europe, were probably not coeval. The caverns having been at one period the dens of wild beasts, and having served at other times as places of human habitation, worship, sculpture, concealment, or defence, one might easily conceive that the bones of men and

¹ Report to British Association on Caves of North Wales, 1886.

² Pre-historic Times, p. 303.

³ See Boyd-Dawkins on Cave Hunting.

those of animals, which were strewed over the floor of subterranean cavities, or which had fallen into tortuous rents connecting them with the surface, might, when swept away by floods, be mingled in one promiscuous heap in the same ossiferous mud or breccia."¹ How greatly this distinguished geologist altered his early opinion we shall see later.

The evidence afforded by the exploration of caves in Belgium, France, and Britain tends to give an antiquity formerly undreamt of to man, as an inhabitant of Europe, nevertheless Mr. Boyd-Dawkins, in his address to the Anthropological Section of the British Association, 1888, says that "the question of man's place in the geological record has advanced but little since the year 1864. Then, as now, his relation to the glacial strata in Britain was in dispute. . . . We may, however, console ourselves with the reflection that the river-drift man appears in the pleistocene strata of England, France, Spain, Italy, Greece, Algiers, Egypt, Palestine, and India, along with the pleistocene animals, some of which were pre-glacial in Britain. He is also proved to have been post-glacial in Britain, and was probably living in happy, sunny southern regions where there was no ice, and therefore no glacial period, throughout the Pleistocene Age.

In all these cavern explorations one fact cannot fail to strike the student, which is, that the works of man traceable to Roman times, or the beginning of history, occupy always a superficial position, and an insignificant space as compared with the older deposits to which no date can be assigned; whilst the oldest of all, characterized by the roughness and massiveness of the implements, and their juxtaposition with bones of extinct animals, are usually sealed down with a mass of stalagmite, which at the most modest computation could not have accumulated in less than some thousands of years, whilst the general contents of the caverns between the traces of their first occupation of man, and the relics of Roman times, are such as to prove conclusively

¹ *Antiquity of Man.*

geographical and climatic changes which could only have taken place under an immense lapse of time.

These changes, according to Sir Charles Lyell, occurred in the following order—

"Firstly, a pre-glacial continental period, towards the close of which the forest of Cromer flourished, and the climate was somewhat milder than at present.

"Secondly, a period of submergence, when the land north of the Thames and Bristol Channel, and that of Ireland, was reduced to an archipelago. This was a part of the Glacial Age, and icebergs floated in our waters.

"Thirdly, a second continental period, when there were glaciers in the higher mountains of Scotland and Wales.

"Fourthly, the breaking up of the land through submergence, and a gradual change of temperature, resulting in the present geographical and climatal conditions."

Those who desire to learn more on this most interesting subject must read Professor Boyd-Dawkins' work on *Cave Hunting*, and his *Early Man in Britain*, where they will find maps illustrative of the various geological and geographical changes traceable in Britain, and also Mr. Pengelly's account of the exploration of Kent's Cavern, given in the Philosophical Transactions for 1878, and in the Transactions of the Devonshire Association.

We have mentioned more than once the difference observable between the earliest flint implements known, and those of a later date, and for the benefit of those not deeply versed in the mode of manufacture of these tools of ancient man, we will here give Mr. Pengelly's description of those found in Kent's Cavern. He says— "While all the stone tools of both the cave-earth and the breccia were paleolithic—that is, of rough unpolished stone—and were found inosculating with remains of extinct mammals, a mere inspection shows that they belong to two distinct categories. Those found in the breccia—that is, the more ancient series—were formed by chipping a flint nodule, or pebble, into a tool, while those from the cave-earth—the less

ancient series—were fashioned by first detaching a suitable flake from the nodule or pebble, and then trimming the *flake*—not the nodule—into a tool. It must be unnecessary to say that the making of a nodule-tool necessitated the production of flakes and chips, some of which were, no doubt, utilized. Such flakes, however, must be regarded as accidents, and not the final objects the workers had in view.”¹

As there are many who do not know the distinctive marks of genuine flint implements, it may be well to add here the description of them given by General Pitt-Rivers. “The recognized marks of human agency which constitute a flint flake, as all pre-historic archæologists are aware, consist of a combination on the same flint of a bulb of percussion on the smooth face, one or more facets at the back, caused by blows delivered in the same direction as that by which the bulb on the other face was produced, and on the top of the flake, contiguous to the bulb, the small residuum of the surface of the core from which the flake was made.”²

It will thus be seen that something more than a fanciful shape is necessary to convince archæologists of the genuineness of a flint implement; but in addition to the shape and marks of percussion, the depth in the soil, the geological strata and surroundings have all to be taken into account in determining the age of these primitive implements; besides which, there is a certain smoothness and patina belonging to the ancient implements which cannot be imparted to modern imitations, although, as is well known, the form can be easily produced by an expert, and many of those manufactured by Flint Jack have been palmed off upon novices, although they would never deceive those accustomed to the feel of the genuine implements. It was of course the (perhaps) accidental discovery that flint lends itself readily to a certain cleavage, that caused

¹ See Report of British Association, 1883. Address of Mr. Pengelly to Section D., Anthropology.

² *Journal of Anthropological Institute*, May 1882, p. 389. Address to Section D., Anthropology, Proc. Brit. Ass., 1883.

it to be employed so largely by early man. Certain it is that large manufactories of flint tools existed at certain spots where flints were abundant, that they were quarried with picks of stag's horn, and often carried immense distances, probably as articles of commerce. Mr. Worthington Smyth found an ancient workshop of these implements among the gravels of the Thames valley, and absolutely succeeded in replacing the flakes struck off a certain core. Doubtless even in those remote times there were skilled workmen whose tools were in especial request, and others who could only make rough implements for their own use, such as would hardly be recognized as implements, and some of these rough specimens discovered in Brixham Cavern have been the cause of much contention; but as others of undoubted human manufacture, and of equal or greater antiquity, have been discovered in other caverns, the genuineness of these is of small moment.

CHAPTER IV.

THE ORIGIN OF MAN.

Ancient and Orthodox Belief incompatible with Modern Discoveries—Darwin's Theory at present unproved—French Anthropologists—Broca's Progression of Types—Ancient Beliefs—Gradual Advance of Man—Great Chasm between Man and Ape—The most Ancient Skulls—The Dolichocephalic (long) and the Brachycephalic (round) Types co-existent—Monogenists and Polygenists—Continental Discoveries of Pliocene Man not credited by English Anthropologists—Lyell and Darwin on Man's probable Age and Birthplace—His slow Dispersal.

THE ancient and orthodox belief as to man's origin was, that he was created in Central Asia in an advanced state of civilization, and that, in consequence of the Fall, some of the descendants of Adam became the ancestors of the degraded races of modern times, whilst other and more favoured races, of the same stock, especially those connected with the Hebrews, have been permitted by the Divine will to rise to the height of civilization. It is difficult to reconcile this belief with the significant fact that rude paleolithic implements have been found in Egypt, India, and Palestine, as well as in Western Europe; neither does it explain how it is that, in the very lands which, by geological evidence, and by the existing remains of an almost extinct fauna and flora, are reasonably supposed to be the oldest of our present terrestrial globe, there do we also find man existing in the lowest state of barbarism.

If man originated in Central Asia in a civilized state only six or eight thousand years ago, how—without

believing in numberless creations of different species of the human race—are we to account for his distribution over the world in various stages of progress, and in so many varieties? Especially, how can we imagine him to have got to Australia in the state in which he was first found, without canoes or any means of transport, yet thousands of miles from the original centre of migration? It is evident that this position could only have been attained when the arrangement of land and water was wholly different from that at present subsisting.

If, however, instead of looking upon primeval man as a civilized being, spreading from some point in Central Asia, and gradually becoming degraded to the lowest point of barbarism in various remote lands, we follow in the track of most modern naturalists; and suppose him in origin to have been little above the brutes, the question arises, whether the slight barrier which separates him from the higher apes can be thrown down, and the Darwinian theory proved in its entirety?

Darwin, as is well known, traces man to a semi-human form, arboreal in habits, hairy, with pointed ears and a tail, as remote from any present variety of ape as from civilized man; but this semi-human being is at present purely hypothetical; geologists and naturalists are agreed that no archaic form yet discovered brings man appreciably nearer to the anthropoid apes which would seem zoologically to be his first cousins, descendants with him from this common semi-human progenitor.

French anthropologists have indeed found many Simian characteristics in the remains of the very early pre-historic races of France, and a gradual diminution of these Simian characteristics with an advance in time and in civilization. Dr. Broca wrote—"I hope you have been able to follow with me from Moustier to Cro-Magnon, from Cro-Magnon to Laugerie Haute, and the Gorge d'Enfer, and from there to the three stations of Eyzies, Laugerie Basse, and La Madelaine, the progressive evolution of an intelligent race, advancing little by little from the most savage state to

the threshold of civilization. The Troglodytes of the last epoch had, so to say, but a step to make in order to found a true civilization, for their society was already organized, and they possessed industries and the arts, which are the two great levers of progress."

This theory of the gradual advance of man from a state but little removed from the brutes, which has assumed so much prominence of late years, was, like the vast æons of geology and astronomy, dimly believed by the ancients. The earliest form of religion was doubtless the worship of deceased ancestors; and viewed in this light, the reverence paid to the cynocephalus in Egypt, and to the monkey-god Hanuman in India, is not devoid of significance. The Indian Hanuman, indeed, with the form of a long-tailed monkey, is endowed with entirely human attributes, helping with his monkey-bands to build the bridge of Rama, waging war with the demons of Ceylon, and playing a most important part in Indian legends. But this semi-simian divinity is not supposed to have existed prior to the human race, but to have been cotemporary with man, and subordinate to many older divinities; and although it is possible that the legend is derived from some Old-World belief in a Simian descent, it is more probable that, like many other legends of semi-human, semi-bestial divinities, it is referable to a remote age of Totemism. The Greek and Roman poets and philosophers do not appear to have been without some glimmering of the lowly origin of man; and Sir Charles Lyell quotes thus the verses of Horace, commencing, "Quum prorepserunt primis animalia terris"—"When animals first crept forth from the new-formed earth, a dumb and filthy herd, they fought for acorns and lurking-places with their nails and fists, then with clubs, and at last with arms which, taught by experience, they had forged. They then invented names for things, and words to express their thoughts; after which they began to desist from war, to fortify cities, and enact laws."¹

¹ *Antiquity of Man*, p. 379.

In modern times Lord Monboddo was the first openly to assert that man was descended from the apes, and he was unsparingly ridiculed for his pains; nevertheless, he was not the only one who saw the probability of a common origin, which some accounted for by supposing apes to be men degraded to brutes for their sins. It remained, however, to Mr. Darwin to place the matter in a scientific light; and there can be no doubt that his conclusions are daily gaining ground among the great thinkers of the day, and that the deductions of the naturalist have been at least partially confirmed by those discoveries of geologists and archæologists which have proved the antiquity and gradual development of the human race. It begins to be seen that the degradation theory is as untenable with regard to the state of modern savages as it is with the apes, and that every discovery shows more plainly and conclusively the universal state of savagery of primeval man. The older the deposit containing traces of his presence, the ruder invariably are the works discovered. To quote once more from Mr. Pengelly, in reference to Kent's Cavern—

"The men of the black mould had a great variety of implements. They used spindle-whorls, and made pottery, and smelted and compounded metals, and wore amber beads. The older men of the cave-earth made a few bone tools, and used needles, and could produce fire; and they even perforated the teeth of mammals, to enable them to be strung as necklaces or bracelets; but they had neither spindle-whorls, nor pottery, nor metals of any kind. Their most powerful weapons were made of flakes of flint and chert, many of them symmetrically formed and carefully chipped; but it seems never to have occurred to them to increase their efficiency by polishing them. The still more ancient men of the breccia have left behind them not even a single bone tool, and no indication that they were acquainted with fire. They made implements of nodules, not flakes, of flint and chert-tools that were rude and massive, had but little regularity of outline, and were but roughly chipped. Whether these old cave-men-more and more

rude as they were more and more ancient—were or were not incapable of anything beyond their savage state, I will not venture to say; but if they were the degenerate descendants of men pretty much like ourselves in powers and gifts, their intellectual progenitors are necessarily shrouded in an antiquity much greater than even that with which we have been dealing, and sooner or later it may in that case be expected that deposits older far than the most ancient yet met with in Kent's Cavern will yield a number, a variety, and a style of human industrial remains that shall utterly eclipse the comparatively rude, yet eminently precious, human relics from Kent's Cavern. When they are produced, science will, it may be hoped, be prompt to recognize and welcome them; and if they should never be forthcoming, it is equally to be hoped that science will ask the advocates of degeneracy to account for the fact."¹

But having traced man back to the lowest depth of barbarism, there would still appear to be a vast chasm between the lowest savage and the highest ape, for no ape would be capable of making and using even the rudest implements of the cavern breccia and of the drift. Human remains traceable to any remote antiquity have, from some unexplained cause, been very rarely discovered; but as far as their testimony goes, they tend to prove that man has always been man, and not a highly-developed ape. Two remarkable skulls of undoubted antiquity have been measured and re-measured by the most eminent craniologists; that of Engis, believed by Lyell to be the most ancient of the two, is of a type decidedly European, brachycephalic in form, and in cubic capacity equal to that of many civilized individuals of our own day; whilst that of Neanderthal, the most remarkable in form ever discovered, and the most ape-like in character, is proved upon admeasurement to exceed the average of many savage races, and to be nearly equal in brain capacity to that of a modern European. It is greatly to be regretted that the jaws

¹ Report of Plymouth Institution, 1875, on "Flint Implements found in Kent's Cavern," by W. Pengelly, F.R.S., &c.

and teeth so characteristic of race should be wanting in both these specimens; but it may perhaps be well to note the peculiarities in the Neanderthal skull which render it so remarkable. These are a very low, narrow, retreating forehead, with enormously developed supra-ciliary ridges. These are ape-like characteristics, which are shared in a minor degree by some existing races, and also by some few skulls of less antiquity found in various parts, but especially at Borreby, in Denmark; at Cannstadt, near Stuttgart; at Eguisheim, on the Rhine; at Denise and some other places in France; and these, coupled with a very remarkable jaw, found at La Naulette, the form and the teeth of which differ as much from the modern human jaw, as the Neanderthal skull differs from that of a modern Englishman, have enabled the French anthropologists, MM. Quatrefages and Hamy, to classify the fossil remains which have been found into several distinct races, of which they reckon that of Cannstadt or Neanderthal first, followed closely by that of Cro-Magnon, whilst some newly-discovered skulls at Spy, near Namur, present certain traits more strongly marked than even in that of Neanderthal.

With these latter skulls some other bones were found which show the men of that remote time to have been shorter and more robust than those of the present day, the muscles strongly developed, limbs short; and if the jaw of La Naulette belongs, as is supposed, to this race, they were enormously prognathous and devoid of chin, the nose also resembling that of the anthropoid apes; nevertheless, although possessed of many Simian characteristics, they were distinctly human.

The Cro-Magnon race shows a considerable advance upon that of Neanderthal. The men of this race were taller, the brow-ridges less marked, the forehead, nose, and chin more developed, and they have been identified with the men of the reindeer period, whose remains have been found in the caves of Dordogne, the Pyrenees, and Mentone. They appear to have occupied Europe, especially near the Mediterranean, during glacial or

post-glacial times, and have been traced as far as the Canaries.

Both these very early races are strongly *dolichocephalic*, that is, long-headed; but with the Cro-Magnon race have occasionally been found *brachycephalic*, i. e. round skulls, the origin of which has puzzled anthropologists. They seem to be somewhat later than the Cro-Magnon race, although intermingled with them, forming mixed races with skulls of various degrees of dolicho- and brachycephalic forms. There is another ape-like characteristic traceable in the bones discovered with these skulls which has lately attracted considerable attention, as appearing in many of the oldest skeletons discovered. This is a peculiar flattening of the shin-bones, called *platycnemism*; but this is not supposed to be altogether indicative of race, but rather to be produced by certain modes of life, and is found in some uncivilized races even now.

Although, therefore, it may be affirmed that bone for bone civilized man corresponds, and has always corresponded, with the higher or anthropoid apes, whose habitat is confined to the Old World, yet he differs greatly from them in height, in relative length of arm and leg, and above all in brain capacity. As we go back to primitive times and to unmixed aboriginal races of the present day, remaining in a state of utter barbarism, these differences diminish considerably, till in the Australians, Bushmen, Esquimaux, Andamanese, and Negroes, we find a gradual approach in one or more characteristics to the apes, still, however, leaving a vast gulf between the lowest man and the highest ape, which, although, as regards volume of brain, it may not be so great as that between the lowest savage and the highest civilized man, yet is not, like that, spanned by a bridge of innumerable links and gradations, but remains broad, well-defined, and impassable. Whether the missing links will ever be found it is impossible to predict. If existent, they probably lie deep down in oceanic mud, and therefore their discovery is more than improbable; for if we would trace man back to his origin, we must

imagine a world geographically quite unlike that we now inhabit.

Most people are aware of the division of pre-historic races into two grand classes, distinguished by the shape of the skull, the long heads (*dolichocephalics*) and the round heads (*brachycephalics*). Of these the *dolichocephalic* would seem to be the most ancient at all events in Europe. Dr. Broca believed that the *brachycephalic* type appeared in Europe only with neolithic implements, and had been introduced by foreigners, but it is now admitted that this divergence of type can be traced to the very earliest acknowledged date of man's appearance upon earth.

Ethnologists are of two schools—*Monogenists*, claiming for all races of man a common origin; *Polygenists*, who allow three or more primitive stocks from which the present races are descended. Theological ethnologists may be said to combine the two schools, since they trace all mankind originally to one pair; and again the three grand divisions of the human race to the three sons of Noah; they however fail to explain how these three sons of one father, dwelling in close proximity, and whose descendants in all probability would be constantly intermarrying, came to have such distinctive progenies, although an attempt is made to account for the blackness of the children of Ham as the result of the curse passed upon their forefather Canaan. Few will now regard this as a satisfactory solution of the difficulty, yet it must be acknowledged that hitherto ethnologists have failed to give any scientific reason for the great differences observable in the human race; differences not only in colour, but in form and feature, in height, in the formation of the skull, hair, and skin, as well as in manners and customs, and in mental power. Some of the minor varieties may indeed be traced to an inter-mixture of race; but the three great divisions, the Caucasian, the Mongolian, and the Ethiopian, as defined by Cuvier, remain distinct, although they have for thousands of years inhabited contiguous regions, and have frequently overlapped and intermingled. Moreover,

it is certain by a reference to the monuments of Egypt, that no perceptible change has taken place in these races within the last 4000 years.

Where then in the remote past are we to look for the common origin of races which have thus remained distinct for so long a period, on the monogenist theory ? or how account for the development of these three distinct types within the same hemisphere, in accordance with the views of polygenists ? Undoubtedly the weight of scientific opinion inclines to the monogenist theory, nevertheless many of the best modern ethnologists, and among them the late Dr. Broca, have been polygenists, but Mr. Darwin is as strongly monogenist in his belief as the greatest stickler for biblical truth, differing, however, in this, that whereas the orthodox trace all mankind to a single pair, called into being by the Divine fiat about 6000 years ago, Darwin would make them the offspring by natural selection of a tribe of highly-developed Simians, allowing for their gradual progress in civilization a period almost incalculable. The latter portion of Mr. Darwin's theory may be considered as established by recent discoveries. The former cannot be so clearly demonstrated, yet it must be confessed that it accounts for many facts otherwise inexplicable, inasmuch as it gives a probable reason for the origin of distinctions of race ; for it is easy to understand that if natural selection was sufficiently potent to produce man, however rude, from ancestors only semi-human, the same force, acting through many ages, and aided by climate, soil, and food, would suffice to produce all the varieties we see. At all events, however many difficulties may beset the path of those who believe in the unity of the human race, whether by a single creation, or as the product of development through natural selection, they are outnumbered by those which surround the advocates of polygenesis ; for nothing short of a succession of miraculous creations could on this hypothesis account for the occupation of remote lands by races resembling those of remote continents, not only in physical

characteristics, but in manners and customs, in language and in mythical beliefs, although some may have advanced much further than others on the road to civilization.

Assuming the unity of the human race, the fact of the very early divergence of mankind into distinct species or varieties has to be accounted for; for at least the three great divisions, the black, the yellow, and the white, can be traced back to the earliest monuments; whilst, as before pointed out, the two distinct types of skulls, the long and the round, are found with the very earliest known traces of man. But although these primitive divisions are universally admitted, the causes which have operated to bring them about still remain a mystery. Buckle insists upon the omnipotence of climate, soil, and food in causing the differences observed, and they are doubtless powerful agents; nevertheless, in the present day they would seem to have lost much of their power, although there is certainly, from some cause, a marked difference between the Anglo-American and the English type since the colonization of the United States, and Englishmen transplanted to some of the colonies become taller and more robust, with a greater amount of beard, than in England, which is all the more remarkable when we remember that in many cases the aborigines of these colonies are short and devoid of beard. That change of food acts powerfully upon the brain is well known, but whether it has a similar effect upon the body is not so easily proved. In the lower animals we find the largest size combined with the greatest intelligence in the elephant, which is wholly herbivorous; but we cannot imagine man to have become what he is if entirely confined to a vegetable diet, yet the apes, his nearest congeners, live upon fruit, and occasionally insects.¹ Natives of lands

¹ The baboons at the Cape of Good Hope have always devoured scorpions, but they have lately taken to killing and eating young lambs; in the commencement they killed the lambs for the sake of the milk in their stomachs, but they appear now to have acquired a taste for meat, and devour the flesh of their victims.

eminently fruitful have but to pluck and eat, and the inventive faculties are not stimulated by want. But if it should be indeed proved that man sprang from some lower form, it is probable that some sudden calamity, in necessitating a change of diet, also brought about an increase of cunning in order to secure it, and that thus instinct was converted into reason; hence primeval man became a hunter and a fisher, and, as proved by the remains found, pre-eminently a flesh-eater.

Since animals would not come to be caught and eaten, cunning and force must be employed to gratify an acquired taste for animal food, and implements must be formed wherewith to attack and overcome the prey. Doubtless this change in habits and in food would quickly produce a variation of type, especially in the early stages of that change, lessening as man became accustomed to a new habitat and new modes of life. The homely proverb that "Necessity is the mother of invention" is the key to man's progress: as long as his wants are supplied with little trouble, so long will he remain almost stationary; but cold and hunger stimulate the inventive faculties, and lead gradually to civilization. Nevertheless, the extremes of heat and cold seem alike detrimental to the full development of human energies, and it is therefore to the temperate regions of the earth, and especially to Central Asia, that ethnologists look as the cradle of civilization; but that man existed everywhere in a state of barbarism prior to all civilization, is a fact proved by the discovery, even in the most ancient seats of civilization, of traces of a lower state, in rude implements of stone and bone; and the remarkable likeness observable in these implements, wherever found, would seem to prove conclusively the unity of the race, and also that it had not, at that early period, become so markedly classed into varieties as is shown to have been the case later. The opinion seems to be gaining ground that this very early type was the Australoid, which, spreading from a centre probably now submerged, may be traced in many of the most ancient remains found. Regarding

Professor Huxley's classification of the ancient Egyptians under this division of the human race, Mr. Busk said some years ago—

"I do not understand Professor Huxley to say or to imply that any of the Egyptian races of which we have any means of judging from statues or pictures ever resembled the existing Australian, except in the character of the hair, dark chocolate-colour, and dolichocephalic skull, &c.; and it should be recollected that the races of which we have any actual knowledge must have been removed from the primordial inhabitants, to whom, I presume, Professor Huxley's remark was intended to apply, by incalculable ages of time, and great vicissitudes of events, and have thus become subjected to great admixture of foreign blood."¹

Doubtless Mr. Busk faithfully interpreted the views of our great English ethnologist, for the Australoid type as represented by the skulls of Neanderthal, Cannstadt, Borreby, &c., was doubtless the earliest of which we have any knowledge, and judging by the implements connected with the remains, was also very widely distributed; but the difficulty of accounting for the advent of the second type, the brachycephalic, at so very early a date, is a tough problem for monogenists and evolutionists.

French anthropologists of this school are tempted to throw back the origin of man to the Pliocene or even Miocene geological ages, in order to allow time for the development of these two types. The proofs of this extremely early existence of the human race rest, however, at present upon such a very fragile basis, that they are almost universally discredited by English anthropologists; they consist of cuttings upon bones, roughly-hewn flint implements, and some reported American discoveries, all of which are too doubtful to be accepted by men of science, chiefly because the manner of their discovery has not been recorded with sufficient care to determine whether they really belong to the geological period assigned to them,

¹ *Journal of Anthropological Institute*, April 1875, p. 478.

whilst in the case of the incised bones, the markings are such as might have been caused by other than human agency.

Lyell, as we know, expected that Miocene man would eventually be discovered, since his nearest zoological relations certainly existed at that period, and Darwin thinks he may have diverged from the catarhine stock at an epoch as remote as the Eocene, "for that the higher apes had diverged from the lower apes as early as the upper Miocene period is shown by the existence of the *Dryopithecus*." It will therefore be seen that although naturalists and anthropologists are both willing to assign an immense antiquity to the *genus homo*, the actual epoch of his appearance upon earth remains undetermined, and the same uncertainty rests upon the geographical region which witnessed his advent.

Three of the greatest naturalists of our time, Darwin, Wallace, and Broca, have all suggested Africa as the probable birthplace of the human race. Darwin writes—

"We are naturally led to inquire where was the birthplace of man at that stage of descent when our progenitors diverged from the catarhine stock. The fact that they belonged to this stock clearly shows that they inhabited the Old World, but not Australia nor any oceanic island, as we may infer from the laws of geographical distribution. In each great region of the world the living mammals are closely related to the extinct species of the same region. It is therefore probable that Africa was formerly inhabited by extinct apes closely allied to the gorilla and chimpanzee; and as these two species are now man's nearest allies, it is somewhat more probable that our early progenitors lived on the African continent than elsewhere. But," he continues, "it is useless to speculate on this subject, for two or three anthropomorphous apes, one the *Dryopithecus* of Lartet, nearly as large as a man, and closely allied to *Hylobates*, existed in Europe during the Miocene age, and since so remote a period the earth

¹ *Descent of Man*, chap. vi. p 156.

has certainly undergone many great revolutions, and there has been ample time for migration on the largest scale.”¹

The extinct mammals found with the paleolithic implements of the earliest known men are mostly of an African type. The elephant, rhinoceros, hippopotamus, and lion, whose fossil remains appear in Quaternary deposits in Europe, have all lineal descendants in Africa at the present day; but whether they came to Europe from Africa, or were driven to Africa from Europe by the change of climate consequent upon the glacial epoch, may perhaps be doubtful. At all events, it seems probable that early man, being before all things a hunter, followed in the track of the game upon which he subsisted, and at a period when a land connection still existed between Europe and Africa, for there is nothing to show that paleolithic man was acquainted with even the rudiments of the art of navigation.

With regard to the two forms of skulls found in connection with the earliest human remains known, a curious fact is noticed by M. Hovelacque in his work entitled *Nôtre Ancêtre*. He writes—“A very striking fact is this, the anthropomorphic apes of Africa (gorilla and chimpanzee) are dolichocephalic, as are the African negroes and the Bushmen; whilst the anthropomorphics of the extreme East are brachycephalic, as are the Negritos of the Andaman Isles, the inhabitants of the interior of the peninsula of Malacca, and of certain parts of Melanesia.”

This observation would appear to localize the two distinctive forms of skull, and to suggest a possible geographical area for each from the remotest pre-historic times to the present day; and it would seem also to denote some local causes, tending to the production of a dolichocephalic type in Africa, and of a brachycephalic in Asia. It is also worthy of remark that the strongly-marked brow-ridges so prominent in the gorilla and chimpanzee, and apparently characteristic of the earliest known paleolithic races, as also of the extinct

¹ *Descent of Man* n 155.

Tasmanians, and in a less degree of the Australian and Papuan of to-day, are not found in the orang-utan of Asia, which has a broad, flat face, to a certain extent comparable with that of the Mongol dwelling in the same land.

But whether we belong to the old orthodox school, and believe mankind to have sprung from a single pair brought into being miraculously in a high state of civilization, somewhere in Central Asia, and thence dispersed over the world to become degraded into the lowest of savages in remote lands; or whether, with monogenists of the Darwinian school, we trace man to a tribe of highly-developed Simians, gradually rising into men in the vast continent of Africa, and thence dispersed over the globe by means of stepping-stones long since swallowed up by the restless, ever-surging ocean, and forming in their isolation new varieties of man; or whether, again, with polygenists, we believe these various races to have originated at various times and in different parts of the world, either by development from some lower form, or by special acts of creation—the problems attendant upon their present and past habitat, mode of life, and relationship to each other are full of intense interest.

It is evident that primeval man in his lowest state of barbarism, having for his sole weapons of offence and defence the rude flint implements of the drift and the breccia, supplemented probably by branches of trees, must have crept slowly over the earth's surface, and could never have crossed the ocean to inhabit the remote lands in which he has been found in almost the same savage state in which we may suppose the makers of the paleolithic flint implements to have been, although at the present day there does not appear to be a single tribe so utterly devoid of all knowledge of the arts of civilization as would seem to be represented by the archaic implements of Kent's Cavern; but it is a significant and suggestive fact that some of the lowest races, as the Australians of the north-east coast, the Bushmen, Hottentots, and Northern Esquimaux, are

still without canoes. Now although the three latter races might have reached their present habitat, even in the present state of the world,¹ without any means of water transport, it is quite impossible that the Australians could have done so; hence, if we are to maintain a belief in the unity of the human race, we must suppose them to have crept to their present position with the singular and ancient fauna and flora of that far-off land, from the common centre, at a time when Australia formed part of a vast continent, since submerged. There are many who hold the belief that in this submerged continent was the cradle of the human race; that there, beneath a tropical or semi-tropical sky, some tribe allied to, but not identical with, the present anthropoid apes (who, it may be observed, seem all to radiate from a point of which this buried land would be the centre) gradually developed into men, at first only one step removed from the brutes, but slowly advancing in the arts which distinguish men, and that in the Australians we see the first steps of that development checked from further progress by gradual isolation, consequent upon the slow submergence of the continent of which it once formed a part. And here we are brought face to face with the intricate problems of geographical distribution, of some of which we must treat in another chapter.

¹ See *Pre-historic Man*, p. 541.

CHAPTER V.

GEOGRAPHICAL DISTRIBUTION.

Importance of the Subject—Effects of Climate, Soil, and Food not sufficiently studied—The Peopling of Oceanic Islands—Darwin and Wallace on Permanence of existing Continents—The Hypothetical Lemuria—Huxley and Flower on the Classification of Modern Races—Latham on the Effects of Climate and Soil on different Races—Isolation as a Preservative of Type—Pigmy Races—The small Dark Race of Europe—Huxley's Four Types—Probable Route of Migration of Australoids—General Pitt-Rivers on Early Modes of Navigation—Distribution of the Great Mongoloid Race.

MURRAY'S *Encyclopædia of Geography*, published in 1834, contains a chapter on the geographical distribution of man and animals, in which the writer treats of the importance of investigating the subject of the distribution of plants and animals in connection with that of man; and after pointing out the many peculiarities of botanical distribution, and that these peculiarities extend, although in a lesser degree, to animals, proceeds thus—"The powerful effect produced on animals by temperature, food, and locality are known to all, whether as regards the range of any particular species, or the numbers of which it may be composed. The effect of these agencies is indeed so great, that some writers have looked upon them as primary causes, and have imagined that by such laws alone has Nature regulated the distribution of the whole animal creation.

The geographic distribution of man is connected in our survey with that of animals; not so much in compliance with the popular notion by which the noblest work of God is classed as a genus next to the

brute, but because we may fairly presume, from the great diversity observed among the human species, that their variation and dispersion is regulated by some general plan ; and that such plan may be analogous to that which is apparent in the distribution of animals. It may be urged, indeed, that such a remarkable coincidence, if proved, might tend to sanction the modern theory of classing man and brutes together ; but the only legitimate construction which we think could be fairly drawn from such a fact, would be that there is but one plan of geographic distribution, and of creation, throughout Nature."

In treating of the causes that have led to the variations of the human race, the writer rejects the theory that particular climates, food, and modes of life have gradually operated through long ages to produce the variations observed, pointing out that whilst the negro in a particular latitude is black, the Indian of Pará in the same latitude is reddish-brown ; that the Gold Coast negroes inhabiting a pestilential region are strong and athletic, whilst the Australians and Bushmen in salubrious climates are lean, emaciated, and scarcely human, and that Europeans long settled in America and South Africa have not begun to change their complexion. " Still less," he adds, " can it be supposed that this departure from one common standard has been effected by civilization, a consequent development of the mental faculties, or even by diversified modes of life. . . . If food, raiment, and moral improvement have such a powerful effect in modifying the human frame, it would naturally follow that tribes living nearly in a state of nature, would all show a close approximation to one common type ; that they would, in short, retain more of the lineaments and characters which must have belonged to our first parents, than if they had deviated from their primitive simplicity ; yet the very reverse of this is the fact. The apparent aborigines of every nation are those in which the leading characters of their own tribe are most conspicuous, and which exhibit the strongest contrast to those of others.

It is only when they have made some progress in the arts of life, when conquest or commerce has led to a union with other races, that the national characteristics, both personal and mental, give way, and begin either to blend, or to be lost in other modifications."

The problems thus propounded by ethnologists half a century ago still await solution. The difficult and intricate subject of the geographical distribution of man, as connected with that of animals and plants, has not received the attention it deserves. Neither has the effect of climate, soil, and food in modifying the physical structure and the mental condition of various races been sufficiently studied. Although Mr. Wallace has written largely upon the geographical distribution of animals, nothing has been done to account for the existence side by side in the same continent of races differing as widely as the negroes of the West Coast of Africa and the pigmy races of the interior, both of which may claim to be aborigines; neither has any satisfactory answer been found to the question of how the remote oceanic islands and the great sub-continent of Australia became peopled with different races in a state of utter barbarism, some of which were wholly devoid of any mode of navigation when discovered by Europeans.

The great continents are all so connected, or show traces of such former connection, as to make the spread of life from a common source a possibility; but it is evident that oceanic islands could not have received mammalian life under present conditions unless by special creation; and it is therefore matter of great interest to ascertain how these remote lands became possessed of their present fauna and flora as well as their human inhabitants, generally of the lowest type of mankind.

Formerly it was supposed that the peopling of remote islands had been effected by changes in land and ocean areas, whereby islands became united to each other and to the continents, being afterwards gradually isolated. But modern naturalists, and notably Darwin, Wallace,

and Sir Wyville Thomson, seem inclined to deny the existence of these natural aids to migration; to assume the general permanence of existing continental areas; and although they allow certain extensions of land, and connections in some instances between islands and the nearest continents, they place these connections at an epoch so remote that the human race could not have been affected by them, since, as far as at present known, they had not yet come into existence.

Mr. Wallace, in his *Malay Archipelago*, points out how nearly the dividing line between the Indo-Malayan and Austro-Malayan zoological regions correspond with the divisions of the human races of Polynesia, concluding that the sea at this point was probably once much wider than at present, and that it is since that sea became narrower that the races have met and intermingled. Commenting upon Huxley's classification of Papuans with African negroes, he says—"Geographical, zoological, and ethnological considerations render it almost certain that if these two races ever had a common origin, it could only have been at a period far more remote than any which has yet been assigned to the antiquity of the human race." He adds—"Polynesia is pre-eminently an area of subsidence, and its great widespread groups of coral reefs mark out the position of former continents and islands. The rich and varied, yet strangely isolated, productions of Australia and New Guinea also indicate an extensive continent where such specialized forms were developed. The races of men now inhabiting these countries are, therefore, most probably the descendants of the races which inhabited these continents and islands. This is the most simple and natural supposition to make, and if we find any signs of direct affinity between the inhabitants of any other part of the world and those of Polynesia, it by no means follows that the latter were derived from the former. For as when a Pacific continent existed, the whole geography of the earth's surface would probably be very different from what it is now, the present continents may not then have risen

above the ocean, and when they were formed at a subsequent epoch may have derived some of their inhabitants from the Polynesian area itself.”¹ Again, in his book on *Australia*, the same author writes—“It is now generally admitted that the only other people with whom the Australian aborigines can be associated are some of the Hill Tribes of Central India, with whom not only their physical features, but to some extent their languages, correspond. The Papuans, who are a decidedly higher race, and most resemble Africans, may have formed a second great wave of immigration, spreading perhaps by means of islands now sunk beneath the waters of the Indian Ocean.”² In his *Geographical Distribution of Animals*, Mr. Wallace writes—“It was probably far back in the secondary period that some portion of the Australian region was in actual connection with the Northern continent, and became stocked with ancestral forms of marsupials; but from that time till now there seems to have been no further land connection, and the Australian lands have thenceforward gone on developing the marsupial and monotreme types into the various living and extinct races we now find there. During some portion of the Tertiary epoch, Australia probably comprised much of its existing area, together with Papua and the Solomon Islands, and perhaps extended as far east as the Fiji Islands, while it might also have had a considerable extension to the south and west.”³

The views of Mr. Wallace with regard to the existence of former continents in the Pacific appear to have changed considerably since the publication of the *Malay Archipelago*, in consequence, as it would appear, of the results of the *Challenger* expedition, for in his work on *Island Life* he entirely denies the possibility of any land connection between the scattered islands

¹ *The Malay Archipelago* (A. R. Wallace), pub. 1872, p. 592, *et seqq.*

² *Australia* (A. R. Wallace and Kean), pub. 1879, p. 105.

³ *Geographical Distribution of Animals* (A. R. Wallace), pub. 1876, p. 465, &c.

of the Pacific, and devotes many pages to the demolition of that hypothetical Lemuria, to which many naturalists have looked as a centre for the origin and dispersion of the Lemurs, and not improbably that also of the human race; and although he gives in his maps such probable land extensions as might satisfy those who think more of a fact than a name, yet he supposes these connections between lands now widely separated to have ceased at such an early geological period as to have been of no service in the dispersion of the human race. Nevertheless it seems difficult, if not impossible, to account for the peopling of Australia unless some stepping-stones be conceded, since the present inhabitants could never have crossed wide seas. The problem is also further complicated by the fact that Tasmania was occupied by a different and apparently still more archaic race, more nearly allied to the Papuans, for whose existence it is even more difficult to account.

Either these races reached their present abode at a time when the geographical land areas were widely different from those now existing; or we must suppose them to be true indigenes, developed from some lower form in their island home; or we must believe that they are the degraded descendants of chance emigrants at a remote epoch, who from long isolation have lost the arts which enabled them to cross the wide ocean, and have become changed also into races differing widely in colour and physical characteristics from the original stock. This is the contention of the Duke of Argyll and others of the orthodox school, but the unprejudiced inquirer will demand more than assertion for that which is opposed to observed facts.

The theory of an indigenous origin for oceanic races may, I suppose, be dismissed at once as untenable, for it exceeds the bounds of reason to imagine that man, as man, could have originated, or been created, in every remote spot in which he is found; besides which there is scarcely a spot, however isolated, in which more than one race cannot be traced, either in the existing

inhabitants, or among the long-buried *débris* of remote ages.

In the classification of modern races the colour of the skin and eyes, and the colour and texture of the hair, as well as the form of the skull, shape of the nose, and proportions of the body, are taken into account; but the two distinct forms of skull, the dolichocephalic and the brachycephalic, as traced in the earliest pre-historic times, are still relied upon as the most distinctive mark of race, and the various modifications of these forms are held to denote admixture at some period.

Tracing these two distinct types to modern times we may do well to quote Professors Huxley and Flower, as to their present distribution. The former says—"Draw a line on a globe from the Gold Coast in West Africa to the steppes of Tartary. At the south and west end of that line there live the most dolichocephalic and prognathous, curly-haired, dark-skinned of men—the true negroes. At the north and east end of the same line there live the most brachycephalic, orthognathous, straight-haired, yellow-skinned of men—the Tartars and Calmucks. The two ends of this imaginary line are indeed, so to speak, ethnological antipodes. A line drawn at right angles, or nearly so, to this polar line, through Europe and South Asia to Hindostan, would give us a sort of equator, around which round-headed, oval-headed, and oblong-headed, prognathous and orthognathous, fair and dark races, but none possessing the marked characters of Calmuck or Negro, group themselves." After remarking the differences of climate between the countries inhabited by the extreme types, Professor Huxley continues—"From Central Asia eastward to the Pacific Islands and sub-continents on the one hand, and to America on the other, brachycephaly and orthognathism gradually diminish, and are replaced by dolichocephaly and prognathism, less however on the American continent (throughout the whole of which a rounded type of skull prevails largely, but not exclusively) than in the Pacific region, where at length, on the Australian continent, and in the

adjacent islands, the oblong skull, the projecting jaws, and the dark skin reappear, with so much departure in other respects from the Negro type, that ethnologists assign to these people the special title of Negritos."¹ Professor Flower, in his excellent Hunterian lecture delivered in 1879, amplifies the sketch of Professor Huxley, and gives in addition to the cranial characteristics, the classification suggested by hair, and by the features of the face, particularly the nose, which has come to be regarded as a very distinctive mark of race. Classing mankind according to hair, two great divisions are observable—the woolly-haired and the straight-haired. According to noses, they have been divided by Broca into leptorhine, mesorhine, and platyrhine.

The lower races may generally be classed as dolichocephalic, woolly-haired, and platyrhine, which were probably characteristics of the earliest pre-historic races, and of primeval man; but in what way this early type became modified so as to produce the variety of races now observed, who can determine? Yet if we are to accept the theory of the unity of mankind, the origin of races has to be accounted for, and the very early period at which the three principal types became stereotyped, so as to be distinctly portrayed on Egyptian monuments of at least 4000 years ago, seems to demand an enormous time for the necessary development, unless indeed we call to our aid a series of miracles.²

It may be well to point out that although the modification of races is extremely slow, as testified by the Egyptian monuments, yet it seems to be going on under our eyes at the present day. Dr. Wilson, at the meeting of the British Association in Dublin, demonstrated the formation of a new race in Canada, and a similar case of the Griquas in South Africa is well known; but these variations are attributable to admixtures, which could not have been a primary factor in the

¹ *Man's Place in Nature*, p. 153.

² Mr. Busk pointed out that four types appear on some of the Egyptian monuments. See *Journal of Anthropological Institute*, April 1875.

formation of the strongly-marked ancient races. Nevertheless few will doubt that the European type is slowly changing in North America, without admixture, and the same may be said of our colonists in Australia and the Cape of Good Hope. In the latter case it may be interesting to note, that although the Bushmen, who may be regarded as aborigines, are among the smallest and least hairy of races, the European settler almost invariably becomes taller than the average Englishman, and develops an unusual amount of beard, whilst the Kaffir, also a modern settler, is tall and well-formed, although the beard is tardy of development, or altogether wanting. Hence it would appear that climate and soil have various effects upon different races. This fact was pointed out by Latham in his article on Ethnology in the 8th edition of the *Encyclopædia Britannica*. He says—"That two localities, one in Africa, and the other in South America, may so closely resemble each other in their physical conditions of heat, light, altitude, moisture, land and water relations, as for the purposes connected with the modification of the human organism to be considered as identical, is highly probable. What, however, if the human organisms thereof notably differ? not the inference that physical conditions either act irregularly or not at all, but that the objects on which they acted in cases under notice, were different. The negro that (say) from Central Asia reaches the Lower Niger, is the descendant of ancestors whose organizations were acted upon by the physical influences of a line drawn through South-western Asia and North-eastern Africa, while the Indian of the Lower Amazons is the descendant of ancestors whose organizations were acted upon by the physical influences of a line drawn through Siberia, the Arctic circle, North America, Central America, and the north-western part of South America."

It is here that Darwin's doctrine of the survival of the fittest comes into play, for there can be no doubt that emigrants to a climate entirely different to that in which they were born require some generations to

become thoroughly acclimatized, and if the change be too sudden, very few will survive; but those few will naturally be the most robust and hardy, and their descendants born in the new environment will probably develop new physical features, and originate a new variety; and this in all probability holds good both as regards men, animals, and plants. Sir Richard Temple, in a speech delivered at the Royal Colonial Institute in 1888, asserted that Europeans in India after two generations began to assume the American type, becoming lank and weedy, and unless recruited by fresh blood from Europe, generally died out in the third or fourth generation; and yet unless ethnologists are greatly at fault, this migration is only a return to the ancient home of the race,¹ although probably to a more southerly latitude; but the Aryan, whose physical organization has been acted upon for many centuries by the colder and more bracing airs of Europe, cannot compete with those Aryan congeners who, starting from the same race-cradle, have gradually acclimatized themselves to India. In like manner natives of tropical countries, suddenly removed to our cold and humid climate, often fall victims to consumption and other diseases from which they are wholly free in their own land. Hence we learn that migrations, which have been successfully carried out, must have been gradual, and the change of type resulting therefrom would of course be gradual also. Doubtless in later times small bands of wanderers, accidental emigrants, or conquering tribes, have by intermarriage with aborigines caused great and sudden variations of type; but this could only have happened after the various races of man had become highly differentiated by long severances, and would not have affected to the same extent the original peopling of the world from one common source.

It would therefore seem probable that the more remote peoples, such as the Australians, cut off for centuries from outward influences, although doubtless

¹ The recent ideas upon the home of the Aryans will be treated of later.

somewhat changed by their environment, would yet represent the original stock from which they sprang much more nearly than other races which have had from time to time communication more or less frequent with other races. Whether the gradual spread of mankind over the earth from a common cradle, with the consequent gradual change of climate, soil, and food, could have been effectual for the production of the various races we see, is a problem unsolved if not insoluble. It would be unwise and unphilosophic to deem it impossible; nevertheless, the early time at which these changes became fixed and stereotyped into the three grand divisions, seem to throw back their common origin to such a remote epoch that we can hardly wonder at the hesitation felt in its adoption. Meanwhile the solution can only be arrived at when the geology of distant lands becomes as thoroughly worked out as that of Europe has been. Every year adds to the number of fossils discovered, serving to link more closely the living with extinct forms, and we know not how soon the semi-human ancestor of man may be found, but this will hardly be in Europe, for it would appear certain that both man and the ape became developed from the parent stock either in Africa, Central Asia, or the islands of the Indian Ocean, and were from the first immigrants in Europe.

But the problem of the geographical distribution of the human race is further complicated by the existence on all the great continents of pigmy races, differing in colour, form of skull, and bodily proportions from the races supposed to be typical of the continent in which they are found. Thus in Africa, the typical home of the stalwart Negro, and therefore designated the Black Continent, we find the Bushman and Hottentot in the south, and the Akkas and Niam-Niams in the centre, very small in stature and yellow in colour. In Asia, the typical continent of the yellow Mongols, we see the tiny black Andamanese, known as Negroids. In Northern Europe there are the small Mongoloid Lapps;

and in America there are the Esquimaux in the north and the Fuegians in the south, differing in size and colour from the typical Red man, who, more or less modified, occupied the whole double continent until partially supplanted by Europeans.¹

The pygmies of Central Africa were described by Herodotus, but their existence was denied by geographers, until re-discovered and described, first by Du Chaillu, and recently by Stanley. Were these small races the true indigenes, driven by conquering races to the extremities of the continents, or to inaccessible mountains and forests, or are they the intruders? The first is usually assumed to be the historic truth, especially as the language of these short or pigmy races is usually as archaic as their physical characteristics. The Mincopies of the Andaman Islands, however, speak an Aryan tongue; but Professor Flower looks upon them as representing a small or infantile type of the same primary group from which all the woolly-haired races have been derived. "That they may be the unchanged or little modified representatives of a primitive type, from which the African Negroes on the one hand and the Oceanic Negroes on the other have taken their origin."

There can be little doubt that a small, dark race, the Melanochroi of Huxley, once occupied Europe. Ethnologists still trace a remnant of them in the West of Ireland, in some parts of England, in the Basques and other dark peoples of Europe, and it is very evident that the legends of fairies, the "little folk" as they are called, have reference to this almost extinct race, which, however, is not regarded as the earliest European race, but a migratory wave from Asia. Of these migrations I purpose treating in a separate chapter, and will merely repeat here the summary of the present distribution of the chief divisions of the human race according to Professor Huxley's four types:—I. The Australioid. II. The Negroid. III. The Xanthochroic. IV. The Mongoloid.

¹ There would seem to be traces of a pigmy race in Central America, but the proofs are doubtful.

The first of these types, the Australloid, he places in Australia, finding their affinities in the Hill Tribes of India, and in the ancient Egyptians, and he remarks upon the singular fact that no trace of the Australloid type has been found in any of the islands of the Malay Archipelago.

The Negroid type is found in Africa, between the Sahara and the Cape, and he regards the Bushman as a special modification of the Negroid type; whilst the Andaman Islanders and the dark oceanic races, including the Tasmanians, New Caledonians, and Papuans, he regards as another modification of the Negroid type, designated as Negritos.

The Xanthochroic type has reference to the white population of Central Europe, mixed on the south and west with the Melanochroi or "dark whites," and on the north and east with Mongoloids. This type is extended from Iceland and the Canary Islands to Africa north of the Sahara, to Syria, Northern Arabia, and Hindostan.

The Mongoloid type occupies an enormous area, extending over the whole of North and Central Asia and the two Americas, as well as the Malay Peninsula and many of the South Sea islands, although mixed in the latter with Negroids.

It will be observed that Huxley adds to the three well-known divisions of mankind—the white, the black, and the yellow—a fourth, which he denominates Australloid, at present occupying Australia and the Hill country of India, but formerly Egypt and a portion of Northern Africa. This classification has given rise to much controversy, and is still objected to by the greater number of ethnologists, but there are several interesting facts which go far to confirm Professor Huxley's theory, one of which is the discovery in ancient Egyptian tombs of true boomerangs¹ such as are still used in Australia, and have generally been regarded as the peculiar invention of this barbarous people.

If we look upon the very ancient skulls discovered in

¹ Several of these boomerangs may be seen among the Egyptian relics in the British Museum.

Europe as of Australoid type, and believe this race to have come from Africa, it seems not only probable, but almost a necessity, that they should have passed by way of Egypt, Arabia, and Persia, to India, and thence by chains of islands now submerged to their present abode, for it must be borne in mind that this race seems to have been always deficient in the art of navigation, as compared with other barbarous races; their canoes being merely pointed logs of wood, or bundles of rushes, although in some parts bark canoes or the ordinary dug-out are found. General Pitt-Rivers has called attention to the likeness subsisting between the rush-floats of Ancient Egypt, Australia, and the Ganges, as in a measure corroborative of Huxley's racial connection between the natives of these widely-separated countries, but he traces these vessels to Formosa also, and adds—"Denon describes and figures a very primitive kind of float of this sort, consisting of a bundle of straw or stalks, pointed and turned up in front, and says that the inhabitants of the Upper Nile go up and down the river upon it astride, the legs serving for oars; they use also a short, double-bladed paddle. It is worthy of notice that the only other localities that I am aware of, in which this double paddle is used, are the Sooloo Archipelago and among the Esquimaux."¹

It is evident that a race so lowly organized must have taken an immense period of time in reaching their present habitat, during which, with the accompanying changes of climate, soil, and food, many modifications may have been possible, and the same may be said of the great Mongoloid race, which from Northern Asia seems to have slowly percolated through the double American continent, showing certainly many modifications of the original type.

¹ *Early Modes of Navigation*, Col. Lane Fox (Pitt-Rivers); *Journal of Anthropological Institute*, April 1875.

CHAPTER VI.

MIGRATIONS.

Civilized Man alone capable of ranging from the Tropics to the Poles—Barriers to Early Migrations—The Phœnicians and the Mammoth—Changes effected by Human Agency—Distribution of Mammals prior to the Advent of Man—Change of Habitat consequent upon Glacial Epoch—Did Man follow the Game?—Professor Boyd-Dawkins on the Eskimo—Early Art of the Reindeer Race—Its Importance—Wanderings of the River-drift Men—The Bushmen, and other Dwarf Races of Africa—Are they also Offshoots of Paleolithic Man?—Neolithic Races—The Basques—Asiatic Migrations—Wanderings of the Malayo-Polynesians across the Pacific—Effects of Involuntary Migrations—Modern Instance—Migrations of the Aryans—Recent Theories.

IF we believe that man physically is similarly constituted to the lower animals, then the same influences which have caused variation and extinction of species among them, would likewise affect the human race. It is, however, evident that man would be less affected than the lower animals, by change of environment, since he alone of all animals has the power of checking and controlling, by artificial means, the influences of climate, soil, and food, which have so powerful an effect upon animal and plant life. Nevertheless, that man is not exempt from these influences is certain, otherwise the present varieties of mankind would not exist.

But it is civilized man alone who possesses the power of ranging from the tropics to the poles unharmed. The savage races are almost as susceptible to external changes as wild animals, and are nearly as incapable of changing and extending their geographical area, since

even narrow seas present an insuperable barrier to migrations, and lakes, rivers, deserts, and mountain chains are to them formidable obstacles. We may be sure, therefore, that all the early migrations, made prior to the invention of the art of navigation, were very slow.

Migration was, as it were, involuntary and imperceptible, caused by necessity, a gradual retreat from cold or drought; or, as primæval man was pre-eminently a hunter, from the change of habitat of his prey. This prey in Europe was, as we have seen, the mammoth, the bear, the rhinoceros, and other great beasts, and somewhat later the reindeer, the horse, the bison or buffalo, the musk-ox, and several kinds of deer and antelopes.

There are people still living who believe that the mammoth was introduced into Britain by the Phœnicians, and that the other great beasts, its contemporaries, as the cave lion, rhinoceros, hippopotamus, &c., were brought over by these same great merchants for gladiatorial combats; in fact one would imagine that these somewhat mythical adventurers were in the habit of constantly wandering over the seas with a sort of Barnum's show, in order to astonish the natives among whom they might be thrown. Strange and ludicrous as such an idea must appear to the geologist and anthropologist, we must remember that all the great changes of fauna and flora in modern times have been brought about through human agency; and that to one unacquainted with geology, it would seem much more natural that lions, tigers, hyænas, bears, elephants, and hippopotami should have been brought here by man, than that they should have been born and bred here, have wandered uncontrolled through our forests, and frequented our caves and rivers.¹

¹ An amusing instance of this, from a religious journal called *The Champion of the Faith against Current Infidelity*, dated April 20th and May 11th, 1882, was quoted by Mr. Pengelly in his Presidential Address to the Anthropological Department of the British Association, in 1883. Speaking of the Victoria Cave, Yorkshire, the writer says—"We have now to present our own

If we pass in review a few of the changes brought about by man in quite modern times, we shall be startled by their magnitude. Four hundred years ago potatoes and tobacco were unknown in Europe, whilst the savages in Australia, New Zealand, and the South Sea Islands had never seen a white face, nor a grain of wheat, nor the ox, sheep, and pig, nor the rabbit, which has since become a pest in Australia and New Zealand.

The dominant white race of Europe had never set foot in America, whilst the horse, now wild on the prairies, was also unknown, although it had existed there in long-forgotten ages. So also the cereals, now so largely cultivated, with the exception of maize, were new to American soil, and maize had never been seen in Western Europe.

If we go back farther still we can trace man's agency always changing the face of nature, exterminating some animals, introducing others; altering the flora of the countries to which he wanders as well as the fauna, by bringing with him seeds and fruits from other lands.

view of the Victoria Cave and the phenomena connected with it, premising that a great many of the old mines in Europe were opened by Phœnician colonists and metal workers a thousand years before the Romans had set foot in Britain, which accounts for the various floors of stalagmite found in most caves, and also for the variety of groups of bones embedded in them. The animals represented by them when living were not running wild about the hills devouring each other, as science-men suppose, but were the useful auxiliaries and trained drudges of the miners in their work. Some of them, as the bear, had simply been hunted and used for food, and others of a fierce character, as the hyœna, to frighten and to keep in awe the native Britons. The larger species of mammalia, as the elephant, the rhinoceros, and hippopotamus, and beasts foreign to the country, the Romans no less than the Phœnicians had every facility in bringing with them in their ships of commerce from Carthage or other of the African ports. These, with the native horse, ox, and stag, which are always found in larger numbers in the caves than the remains of foreign animals, all worked peacefully together in the various operations of the mines. . . . The hippopotamus, although amphibious, is a grand beast for heavy work, such as mining, quarrying, or road-making, and his keeper would take care that he was comfortably lodged in a tank of water during the night."

Great changes in Great Britain can thus be traced to the Roman occupation, whilst the monuments of Egypt, Assyria, and Greece show the same process at work in far more ancient times; nor must we omit the record of the King of Tyre bringing apes and peacocks from a remote unknown land to grace the court of Solomon.

But we cannot imagine man as having had anything to do with the deportation of those great beasts which ceased to exist long before he had invented any means whereby such creatures could have been transported across the seas, even if he had at that time attained to any knowledge of the art of navigation. If we advance still further through the corridors of time, and look into the magic mirror held up to us by geology, we shall find the changes wrought by man infinitesimal as compared with those which took place without his interference, since they were for the most part prior to his existence. Let us look for a moment at the wonderful transformation thus revealed to us, and see how far we can trace the means by which it has been produced.

It seems hard to realize the undoubted fact that at a late geological period, instead of the oxen, sheep, goats, deer, and swine so familiar to us now, Europe, including Great Britain, was the home of animals now either extinct or known only in Africa and in the extreme north. I have already spoken of some of these, the hippopotamus, hyæna, rhinoceros, elephant, cave lion, a species of tiger, cave bear, as well as smaller animals too numerous to mention, which have been found here in a fossil state, but which have long since all vanished from Europe, and many of them from the world, having been supplanted by new species, now found only in Africa or Southern Asia. In addition to these we find the reindeer and musk-ox, which are now known only in extreme northern latitudes, and the great elk, which seems to have lingered on to comparatively modern times in Ireland. We thus see mingled together a tropical and an Arctic fauna, which by and by die out or disappear, to be replaced by the existing European animals of a totally different type;

and with these changes we find corresponding changes in the accompanying human race.

If we go back still farther to the Tertiary period of geology, we find mingled with the remains of animals such as those mentioned above, which although extinct in Europe have representatives in Asia and Africa, others which seem to have died out and left no living representatives. Farther back still in Secondary strata we are startled to find, in the words of Mantell, that "the fauna and flora of this ancient land of the Secondary epoch had many important features which now characterize Australasia. The Stonesfield marsupials and the Purbeck *Plagiaula*x are allied to genera now restricted to New South Wales and Van Diemen's Land; and it is a most interesting fact, as Professor Phillips was the first to remark, that the organic remains with which these relics are associated, also correspond with the existing forms of the Australian continent and neighbouring seas; for it is in those distant latitudes that the waters are inhabited by Cestracions, Trigoniæ, and Terebratulæ; and that the dry land is clothed with Araucariæ, Tree-ferns, and Cycadeous plants."¹

Here then we find among the fossils of our island, small as it is, and surrounded by the ocean, animals and plants of types belonging to all lands and all climates, from the tropical to the Arctic, many of which have become quite extinct, whilst others survive in a modified form in remote lands, and even at the Antipodes; and it will be noticed that those which are the farthest removed in space, are also the most archaic in type, as the marsupials and tree-ferns of Australia. Thus we have the whole problem of geographical distribution brought before us at a glance, and the difficulties it presents must be apparent to every one. Whence came those antiquated forms which have left their fossilized remains to tell of their presence in a land to which they have been for so many ages strangers? Was there some central spot whence they spread themselves to Australia on the one hand, and Great

¹ *Wonders of Geology*, vol. ii. p. 511.

Britain on the other?—or did they arise in both lands by creation or evolution at different geological periods? I suppose there are few now who would affirm that opossums, kangaroos, &c., with the peculiar vegetation now known as Australian, were first *created* in Great Britain, suffered to die out there, and then re-created in Australia, to be succeeded in Britain by great beasts which have since been found only suitable for the tropical lands of Asia and Africa? But if we cannot look to new creations for the explanation of facts which cannot be gainsaid, we must be prepared to admit vast geographical changes, and immense periods of time. The first evident change which suggests itself is, that at the time when Great Britain was occupied by the ponderous beasts enumerated, it could not have been the small isolated island it is now, but must have formed an integral portion of the European continent. This, indeed, we know from geology has occurred more than once in the long past geological ages, and the projectors of the Channel Tunnel now turn to advantage that continuous chalk formation which once served as a causeway between England and France. This, however, is a small change compared with those geological revolutions which must have taken place in other parts of the world to allow, first, of the interchange of animals and plants, to be followed by that subsequent isolation which has preserved certain types from extinction in remote localities, as the marsupials in Australia, which, as I have before pointed out, represent a type which existed in Europe at a remote geological period.

Mr. Sclater was the first to map out the existing fauna of the world into regions, and to lay down the general law—"That the more distant countries are, the more dissimilar are their animals and plants; and that if the animals and plants of two countries are alike, they must either now or recently have been in geographical connection"—and this he has illustrated by (1) "The Antilles, or West India Islands, which have in many respects a peculiar fauna, containing a certain

number of animals not known to occur elsewhere. But in Trinidad—the most remote of them—these animals do not occur, but another set the same as those of Venezuela are found. It is therefore evident, if the above proposition be true, that Trinidad is merely a little bit of the South American continent broken off at a comparatively recent epoch. (2) In the same way we know that the animals and plants of the British Islands are identical, or very nearly so, with those of the rest of Northern Europe. And we conclude, therefore, as is likewise manifest from geological investigations, that the Straits of Dover are of comparatively recent formation. (3) A third well-known instance is afforded by the islands of Sumatra, Java, and Borneo. Java is much nearer to Sumatra than Borneo. But the animals of Sumatra and Borneo are very nearly alike, whereas those of Java are in many cases different. It has been argued, therefore, and will no doubt be ultimately found to have been the case, that Sumatra has been joined to Borneo more recently than to Java.”¹

Mr. Wallace gives much fuller details than Mr. Sclater, and brings forward a great many curious and anomalous facts, especially with regard to the fauna and flora of the various islands; but into these we cannot follow him, although we must remark upon the singular fact that many islands do not derive their animal and vegetable life from the land nearest to them, but apparently from that most distant; more especially is this remarked in the case of Madagascar, which, lying close to the African continent, yet possesses a fauna and flora more nearly resembling South America. Mr. Wallace, however, does not look upon this as denoting that South America and Madagascar have ever been united by direct land connection, but that both have been peopled from a common source, the intermediate links having been destroyed, or rather superseded by more modern forms; that is to say, that the forms now found in South America and Madagascar

¹ Lecture on *Geographical Distribution of Animals*, Manchester, 1874.

have once been very widely spread, but have since become restricted to the regions where they are now found.

There can, however, be little doubt that in some cases a change of climate has been the chief factor in causing the migrations of animals. Thus, the reindeer and the musk-ox—the former so abundant in Europe during, or immediately after, the glacial epoch—undoubtedly followed the retreating ice and snow to their present habitat, and it is one of the most interesting and debatable of modern problems, whether they were followed in their retreat by the hunters who are known to have lived upon them during their sojourn in Europe. Many people look upon these men of the reindeer period as an extinct race, but Mr. Boyd-Dawkins finds them in the modern Eskimo, who still live much as the paleolithic reindeer race lived, using many implements almost, if not quite, identical with those used by the European hunters of the reindeer, and distinguished like them by great artistic skill.

The reindeer race was considered by Broca to be a second and more advanced wave of emigrants of a cognate race to the men of Neanderthal, Cannstadt, and Borreby, but whether they came to Europe from Africa, or from Asia, or developed a higher civilization by long residence in Europe, has never been determined; although could we trace the prior habitat of the reindeer, it would probably reveal that of the paleolithic hunters, who have delineated him so truly on bones and stones found with other relics in French and German caves. Many casts of these very early drawings may be seen in the British Museum, and many more are figured in M. Cartailhac's work *La France Prehistorique*. Perhaps the most interesting of all is the picture of the mammoth, drawn on a piece of the tusk of that animal, proving conclusively the contemporaneity of man and the extinct mammal; the reindeer is very frequently figured, singly and in groups, and also the horse and what would appear to be a quagga or zebra.¹ The

¹ Perhaps the hipparion, which is known to have lived in Europe in Miocene times, and might have survived.

bear, the ox, the boar, the seal, fish, and snakes, are all depicted, as well as human figures, the latter always nude, although, in one case at least, adorned with necklaces and bracelets; yet it is certain from the needles found that they must have made and used clothing, probably of skins.

The great interest which attaches to these works of art, in addition to their merit, is the proof they afford that the animals whose bones are found together in caves, really co-existed with each other, and with man, but the animals depicted seem to be chiefly of the Arctic type, signifying that the period was glacial. We do not find the lion, the hippopotamus, the rhinoceros¹ represented, but the mammoth, the reindeer, the seal; and it certainly does not seem unreasonable to suppose that since all these have retreated to the far north, the men who represented them so truly might have followed their prey, and that their descendants may now be traced in the Eskimo, leading a similar life, using similar tools, and trapping the same game; although the reindeer race of paleolithic times do not appear to have domesticated the reindeer as the Eskimo of the present day do.²

It may be well here to give a list of the animals, according to M. Cartailhac, found in the caves of France, and now either extinct or migrated.

Extinct	<i>Ursus spelæus.</i> <i>Felis antiqua.</i> <i>Rhinoceros tichorhinus.</i> <i>Elephas primigenia.</i> <i>Cervus megaceros.</i> <i>Ursus Ferox.</i> <i>Ovibos moschatus.</i> <i>Cervus canadensis.</i> <i>Felis leo (spelæa).</i> <i>Hyæna crocuta (spelæa).</i> <i>Antilope saiga.</i>
Migrated	{ Towards the west { Towards the south { Towards the east

¹ One representation of the rhinoceros has, I believe, been found.

² It has, however, always struck me that the complicated lines to be seen in the group of reindeer from these caves, in the British Museum, may represent reins or harness.

Migrated	To the Arctic regions	Gulo fuscus. Canis lagopus. Lemnus. Lagomys. Cervus tarandus. Arctomyś marmota. Antilope rupicapra. Capra ibex. Ursus arctos. Felis lynx. Canis lupus. Castor fiber. Bos primigenius. Bison europaeus. Cervus alces. Equus caballus.
	To the high mountains	

Existing species of the temperate zone of Europe on the point of extinction.

It is supposed that a great interval of time intervened between the men of the Drift, that is the earliest paleolithic race, and the hunters of the reindeer known as cave-men, because their relics are found chiefly in caves in which they seem to have lived, accumulating therein vast masses of *débris*, proving long occupation. Dr. John Evans, however, thinks they were probably of the same race and cotemporaneous; their range, however, and stage of culture, appears to have been very different.

The River-drift men, says Mr. Boyd-Dawkins, wandered over the whole of Europe south of Norfolk, leaving traces behind in Spain, Italy, and Greece, and through Asia Minor and the whole of India. The cave-man is restricted to the area extending from the Alps and Pyrenees as far north as Derbyshire and Belgium, and has not as yet been found farther east than Poland and Styria.¹

Mr. Dawkins believes the River-drift man to have existed in Europe for countless generations before the advent of the cave-man, and to have become extinct like many of the animals which co-existed with him.

It is very singular, that the cave-men existing at so very early a period of the world's history, should have developed so much artistic skill as is shown in their

¹ *Early Man in Britain*, p. 232.

drawings, but it is also a very noteworthy fact that the same artistic skill is displayed not only by the Eskimo, supposed by Mr. Boyd-Dawkins to be their lineal descendants, but also by the Bushmen of South Africa, a race very low in the scale of humanity, but whose drawings and paintings will bear comparison with those of the cave-men and Eskimo.

The late Sir Bartle Frere possessed a large collection of these Bushmen drawings, many of which were very remarkable, not only as works of art, but as historical records. In one of them these rude artists had depicted their own conquest by the Kaffirs, under the symbol of a black hand grasping a grasshopper. The Bushmen may be regarded as the cave-dwellers of Africa, and their weapons and mode of life seem to resemble that of the ancient Troglodytes, whilst their language is undoubtedly one of the most archaic known. It therefore seems to me neither impossible nor improbable that they also may eventually be recognized as akin to the cave-men of Europe, percolating slowly through Africa in pursuit of the retreating game, which after deserting Europe during the great Ice age, have become modified in course of long ages into the lion and elephant, rhinoceros and hippopotamus of modern times. Besides the Bushmen¹ there are numerous dwarf tribes or races in the interior, described by all travellers as differing widely in size, colour, and other particulars from the black races, and which, in the supposition I have ventured to make, may be regarded as various offshoots from the parent stock of paleolithic times, changed in the lapse of ages, for they seem to have no affinity with the Negro, the Kaffir, and the Arab, who at present divide the great African continent except where they have been displaced by Europeans. Some of the migrations of these latter races have taken place in

¹ We must not omit to mention here the dwarfs described by Mr. Stanley as dwelling in the great forest, a race evidently akin to the Bushmen, and which seems traceable much farther south, being described by Mr. A. A. Anderson in his *Twenty-five Years in a Wagon*.

what may be regarded as historical times, although the original home of the great Bantu or Kaffir race has not been defined.

Returning to Europe, we find that when the great ice cap of the glacial period had disappeared, a new race, with new weapons, new modes of life, and more advanced in civilization, makes its appearance, ushering in the neolithic, or polished stone age. But with neolithic times there is a decided change not only in weapons, but in the type of skull of their users, which leads to the inference that a new route of migration had succeeded the old ; that probably the connection with Africa had ceased, and that with Asia had commenced, or become more practicable. This is testified not only by the advent of a race with Mongoloid affinities, bearing with them weapons of better form and finish ; but also by the fauna by which they were accompanied ; by the style of architecture which they seem to have introduced ; by their mode of sepulture ; and by their knowledge of pottery, and of cereal agriculture, for the cultivated cereals, wheat, barley, rye, seem to have been of Asiatic origin. It is not, however, necessary to suppose that all these advances in civilization were brought to Europe at the same time, for a way having once been opened, it is probable that a succession of migrations took place, and each may have added somewhat to the knowledge of its predecessors. This race or succession of races, perhaps, contributed what Professor Huxley has called the dark-white, or Melanochroic type, to the population of Europe ; which type has by many ethnologists been found in the Basques of the present day.

If these people introduced the fashion of lake-dwellings, which continued far into the Iron Age ; and if, as seems also probable, they introduced the dolmen and the stone circles so widely distributed, they must have spread themselves by degrees, not only over Southern and Western Europe, but also along the north of Africa where these monuments are traced ; and where Dr. Broca finds among the Berbers and other North African tribes, skulls resembling the Basques, whilst Mr. Hyde

Clarke sees affinities of language. M. de Mortillet, by means of the domestic animals, the cereals, the curvilinear mode of ornamentation, as well as by the monuments introduced by these people, traces them to the Caucasus, Asia Minor, or Armenia. But the monuments and the pile-dwellings are found much farther to the east, and exist among the Hill Tribes of India, whilst pile-dwellings are found also in New Guinea and Central Africa. These extensions of similar customs do not, however, always imply racial connection, but only some relationship, perhaps commercial, for it is evident that commercial relations existed between distant lands in these remote times, to an extent we are slow to acknowledge, and a custom originating in one spot might thus spread north, south, east, and west, from this centre. A route once opened between Asia and Europe would be followed from time to time, not by one race or tribe only, but by any people endowed with the migratory instinct, or who might be driven from their native habitat by an invasion of stronger tribes; and this would account for the great variety of races traceable in the populations of Europe, most of which are supposed to have been of Asiatic origin.

The migratory instincts of the human race are well shown by the comparatively recent wanderings from island to island in the South Seas, where the Malayo-Polynesians have displaced and are still displacing the earlier Papuans or Melanesians, who, with less perfect means of navigation, had yet succeeded in peopling these isolated lands at a remote period. But even these were not apparently the primary inhabitants, since in many of these islands are found monuments which cannot be assigned to either of the present occupying races, but which seem to have been the work of a more civilized race, which has wholly disappeared. How they got there, and when, are matters of conjecture, although it would not seem difficult to prove that it was by this route that the civilization of Peru became approximated to that of the Old World, for a people capable of ranging from island to island across

the Pacific, would certainly be able to take the further step to the American continent; and Easter Island, with its huge stone monuments, may fairly be regarded as one of the stepping-stones in this migration, which may have been originally accidental, for it cannot be doubted that from time to time vessels have been driven by storms from their destined course, and carried by currents to unknown lands, and some of the scattered islands of the Pacific may have been thus peopled, whilst the Peruvian and Mexican traditions of strangers coming by sea and teaching them agriculture and other arts, appear to me to have a basis of fact, although American antiquaries reject the legends and believe in the indigenous origin of these early civilizations. That strangers appearing suddenly in the midst of barbarous peoples are regarded as supernatural beings and often venerated accordingly, we know from many historical records, of which I will cite two instances in modern times. First that of Buckley, in Australia, who chancing to take a spear from the grave of a chief, was looked upon as the embodied spirit of the deceased, and was consequently treated with great respect and consideration by those who had never before seen a white man.

In the second place there is the recorded instance of several whites, and amongst them three or four women, who were wrecked at the mouth of a small river on the south-east coast of Africa in the early part of last century. One of these women was taken as a wife by a Kaffir chief, and enjoyed for many years the chief place of authority in the tribe, amongst whom she seems to have been most highly venerated. This chieftainess, known as Quma, who was probably English, as she had a daughter named Bess, seems to have taught the tribe to eat fish,¹ which no other Kaffir tribe will touch, and also to cultivate the sweet potato. Mr. Van Reenan, who had been sent from the Cape to inquire about these shipwrecked whites, describes them as then (in 1790) old women. He says he would have taken the three

¹ Mr. Kay noticed heaps of oyster-shells in the villages of this tribe.

surviving—Quma being dead—back to the colony, but they begged to remain with their children and grandchildren. Quma's son Daapa was a great chief, and it is said his enemies dared not attack him when in his prime with less than double or treble his force. "For," said one, "he and his men have the white man's blood in them." Daapa told Mr. Kay, the missionary who relates this history, that his mother was white, that her hair was at first long and black, but before she died it was quite white. Asked why he resided near the sea, he replied, "Because it is my mother; from thence I sprang, and from thence I am fed when hungry." "This," says Mr. Kay, "I am told is a figure of speech frequently used by him in reference to the wreck of his mother and the supply of fish which he and his people obtain from the deep in cases of emergency."¹ Quma had five children, but only Daapa and his sister Bess survived at the time of Mr. Kay's visit, and he says truly, had these been dead the traditional accounts in the fourth or fifth generation might have been regarded as mere romance. The description he gives of the mixed descendants of these white women is of interest to anthropologists. Daapa's children, by several wives, numbered twenty-two, eleven being sons. "The eldest seems to be about forty-five, and in point of appearance is one of the most haggard, filthy, and ill-looking natives I ever met with. Some of the others also are anything but handsome; their black shaggy beards, long visages, eyes somewhat sunk, prominent noses, and dirty white skins give them a wild and very unpleasant aspect."² One of these sons of Daapa, grandson of the shipwrecked Quma, was named Johnny. "The word of Quma was a great word," said the natives. "When Quma our eyes saw, the hungry were always fed."

Here then we see in modern history an incident similar to that related in the Peruvian story of *Manco Capac and Mama Oello*, who, being strangers coming up

¹ *Caffrarian Researches*, by Stephen Kay, p. 304.

² *Ibid.* p. 306.

from the sea, taught the natives the cultivation of maize and other useful arts. Why should this be regarded as incredible in Peru, and set down as a sun myth, when a similar incident undoubtedly happened in South Africa a century ago, causing changes in the food and agriculture, and in the physical characteristics of at least one Kaffir tribe?

The human race may be aptly compared to the waves of the sea, ever in motion, carried by currents from coast to coast, sometimes dashed by storms against unknown rocks to fall in spray far inland, leaving no trace behind save perhaps in a water-borne seed, to spring up as a new plant, or in a piece of wreckage at which men may marvel. The great onward movement is migration, always in process; the storm-tossed spray is an accidental incident in the migration, which yet may be productive of great things, as we have seen in the introduction of new blood, new manners and customs, new beliefs, new implements and improvements in art.

A great migration, or series of migrations, which has been productive of the most momentous consequences to the human race, has lately become the subject of a great conflict of opinion among scholars, chiefly philologists—it is that of the great white race, formerly denominated Caucasian, from the supposed region of their origin as a race, and known later as Aryan. This race, which has become the dominant race of the world, had always been supposed to have originated somewhere in Central Asia, and to have spread thence to India and Persia on the one hand, and Europe on the other. Lately, however, German scholars, notably Penka and Schrader, have come to the conclusion that Scandinavia, or the countries adjoining the Baltic, must have been the primitive home of the Aryans, and this theory has been taken up enthusiastically by Canon Isaac Taylor and Professor Sayce, who find their nearest congeners in the Finns.

This theory is based chiefly upon linguistic grounds, with which I am not competent to deal; but it may be

broadly stated that from the words used to designate trees, animals, and certain articles in common use in the various Aryan languages, it is concluded that the early Aryans before their several migrations, knew the oak, the birch, the beech, the fir, the bear, the wolf, the stag, the elk, and other things pertaining to Northern Europe, such as barley and rye, but knew nothing of wheat, which is a more southern grain, nor of the palm and the tiger, which are distinctly Asiatic. They say also that the primitive Aryans must have lived near a sea where the lobster, the seal, and the oyster were found, all which would seem to denote a northern sea-coast more in accord with the Baltic than the Caspian. The subject is altogether too wide, and too much in dispute, to be entered upon here, the only generally accepted facts being that this white, or Aryan race, occupy, and have occupied for unknown ages, India and Persia, as well as Europe; that they must have had some point of dispersal which up to this present is not known; but they certainly were not indigenous in India, or in Central Europe, where there are evident traces of more than one older race. Meanwhile it may be affirmed that the origin and migrations of this great Aryan race remain undetermined, although the theory of Penka seems gaining ground; but the disputes on the subject among the learned show how complicated is that which at the first glance might seem to be the most easily traceable of human migrations.

Their appearance in Europe brings us to the Bronze Age, for they were undoubtedly acquainted with the use of metal. Whether they are to be identified with the Kelts has not yet been determined, but it is certain that since their advent civilization has made rapid progress; the use of metal tools and weapons gave their users a great advantage over the users of stone implements, although, doubtless, stone continued to be used for many purposes long after the introduction of bronze,¹

¹ An instance of this may be cited from the recent discoveries of Mr. Flinders Petrie in Egypt, for in the cities explored he found implements of stone, copper, and bronze, all apparently in use at

and probably even into the Iron Age; but with the Bronze Age we may consider the era of civilization to have fairly begun at least in Europe, and doubtless a similar stage of progress had been reached long ages before in the far East and in Egypt, which has always been in the van of human progress.

the same time. It must be borne in mind that it is the entire *absence* of all metal which constituted the age of stone.

CHAPTER VII.

PRIMITIVE AGRICULTURE.¹

Agriculture the First Step towards Civilization—Probably Originated with Women—Antiquity of Cereal Agriculture—Native Names—Maize—Was it known in the Eastern Hemisphere prior to Columbus?—Turkey Corn—Ancient Cultivation in America—Food of Ancient Egyptians—Roots and Fruits preceded Cereals—Chinese Agriculture—Moon-Worship among Agriculturists—Lunar Influence on Plants—Agricultural Implements—Bushman Digging-Sticks—The Primitive Plough—The Tribulum of the East—Women as Agriculturists—Terraced Agriculture in China and Peru.

IT has been justly remarked by Mr. Crawford that “no people ever attained a tolerable degree of civilization who did not cultivate one or other of the higher cereals,” and yet, strange to say, the subject of Primitive Agriculture is enveloped in mystery. We know, indeed, that the cultivation of bread-stuffs dates from a most venerable antiquity; that, as the author before quoted says,—“The architectural monuments and the letters of Egypt, of ancient Greece, and of Italy, of Assyria, of Northern India, and of Northern China, were all produced by consumers of wheat. The monuments and letters of Southern India, of the Hindu-Chinese countries, of Southern China, of Java, and of Sumatra, were the products of a rice-cultivating and rice-consuming people. The architectural monuments of Mexico and Peru, and we have no doubt also of Palenqué, were produced by the cultivators and consumers of maize.”² But when

¹ See *Journal of Anthropological Institute*, May 1877.

² *Plants in Reference to Ethnology. Trans. Eth. Soc.*, vol. v. p. 190.

we ask, as we very naturally do, to what people are we indebted for the origin of agriculture, and where is the native land of the cereals thus so early known, so widely spread, and so successfully cultivated in pre-historic times ? we are met with vague and uncertain responses, even from the most accomplished of ethnologists and botanists.

Archæological records prove that man in his earliest condition was no cultivator of the soil, no keeper of herds and flocks, but a wild and savage hunter, flitting from place to place continually in pursuit of his prey ; but, judging from the habits of modern savages, as tribes multiplied it must soon have been found inconvenient to allow the women and children to accompany the men in all their hunting expeditions ; these, therefore, were probably left encamped in some convenient spot, to await the return of the hunters from distant raids upon the wild denizens of the forests.

That agriculture originated with these watchers and waiters, seems at least probable, for amongst them food must have been often scarce, and in time of famine strange diet becomes both necessary and acceptable, and fish, bird, and insect must often have been supplemented by wild fruits and roots, and at last by the grasses, the seeds being eaten without preparation. But as savages and animals, both wild and domesticated, learn by experience what to eat and what to avoid, so experience must have taught these primitive peoples that the seeds of the various grasses which they found growing wild, were not only good and sustaining food, but might be improved by being pounded and deprived of their husks, and by being either parched or mixed with water and baked or boiled ; and doubtless they soon learnt by observation that these seeds, scattered over the land, would reproduce their kind, and furnish them with food for another season of scarcity. The almost universal employment of women exclusively, in agricultural pursuits among the lower races, may, perhaps, be adduced in confirmation of this conjectural origin of agriculture, which certainly could never have

originated with nomadic tribes, because they could not have remained long enough in one spot to sow the seed and reap the harvest.

It is evident that the discovery of this eminently useful art, would be a powerful aid to the formation of settled tribes, and eventually of civilized communities and powerful nations; because the necessity for a wandering life would thus by degrees be done away with; the long journeys in search of food would be gradually abandoned for the cultivation of the soil, and herds would be kept to supplement the uncertain products of the chase, rendered yet more uncertain by the multiplication of man in one spot, and the consequent withdrawal of wild animals to a safe distance from their enemies. Thus man would become more and more dependent upon agriculture and upon the rearing of tame cattle, and from a hunter would become a husbandman.

Taking this to have been the origin of agriculture, it is of course possible, nay probable, that the cultivation of the soil may have originated in many unconnected countries, and at various times; but it is remarkable that many peoples, some living in fertile countries, have yet remained in total ignorance of this earliest of the arts to the present day; but then such tribes have either continued to be houseless, wandering savages, whose simple wants are supplied by natural products, or, like the Esquimaux, the climate in which they lived has prevented any successful attempt at agriculture.

Then again, neither Australia, New Zealand, nor the numerous Pacific Islands would seem to possess any indigenous species of grain, although some of the wild barleys and oats are found in New Zealand, Easter Island, and the West Indies; and in Australia a grass abounds which they say is neither good for man nor beast, but which yet resembles so much in outward appearance some of our cultivated grasses, that one is tempted to believe that this also might be developed into corn, and even to wonder whether here, in this

ancient land, we may not trace the origin of some of our cereals.¹

It is, however, generally agreed that we must not look to the southern hemisphere for that development of agricultural skill resulting in the cultivation of the cereals; for throughout all these scattered lands, agriculture, where it does exist, consists in the cultivation of roots and trees indigenous to those lands. The growth of the cereals requiring greater skill, represents also a higher stage of development in the races who, from wild originals, brought them into a state fit for the nourishment of man. That all our cereals sprang either spontaneously, or by cultivation from wild originals, cannot be doubted; but when we find that in the lake dwellings of Switzerland, belonging to the Stone Age, three kinds of wheat, two of barley, and two of millet were certainly known, we are forced to believe that the wild originals of wheat and barley must have merged into the cultivated at an extremely early period in the history of our race, and that the art of agriculture must be of extreme antiquity.² This fact is, indeed, testified, not only by the knowledge of the art possessed by the lake dwellers, but by discoveries of corn with Egyptian mummies of vast antiquity, by traces which have been found, not only of corn, but of the furrows made for the cultivation of it, beneath bogs and peat mosses of great depth, and by the discovery of maize by Mr. Darwin on the coast of Peru, in a raised beach eighty-five feet above sea-level, and in tombs belonging to a race long anterior to the Incas. But the countries producing the wild originals of our cultivated cereals, and therefore by inference the races also to whom we are indebted for their cultivation, remain unknown.³

¹ We find, indeed, that the seeds of this grass (*Panicum levinode*) are used by the natives of the interior to make a sort of paste, which is described as sweet and palatable. See *Tropical Australia*, Lieut.-Col. Sir T. L. Mitchell, p. 98.

² See Belt's *Naturalist in Nicaragua*, and Rennie on *Peat Mosses*.

³ General Pitt-Rivers, in his carefully-conducted excavations at Rushmore, found wheat of the Romano-British period, which in

Mr. Crawford, in pointing out the fact that the names for wheat and barley vary in almost all languages, and that this variation in the names given to the cereals points to their having been independently cultivated in many different localities, says, that in Basque, the names for wheat, barley, and oats are purely Basque, while those for rye, rice, and maize are of Spanish origin. "The inference is," he says, "that the first-named plants were immemorially cultivated by the Basques, and the last only introduced into their country after the Roman conquest of Spain."¹ The mention of oats among the earlier list would seem to be a confirmation of the theory of most archæologists of the present day, that the Basques are the remnant of that pre-Aryan race to whom we are indebted for the introduction of bronze, since we are told, that oats do not appear in the Swiss lake villages before the age of bronze. Rice would seem to have originated in tropical Asia, and never to have found its way in any considerable quantity into Europe in primitive times, either as an article of commerce or of agriculture.² Even now it is very little cultivated, except in Asia, where it forms the food of millions, and in tropical America, where it has been introduced in modern times.

It has been commonly accepted as an indisputable fact, that maize is indigenous to America, and was unknown to the eastern hemisphere before the time of Columbus. Whilst, however, allowing, in the absence of proof to the contrary, that America was the native land of this most useful cereal, I cannot think that the date of its introduction to the Old World has,

size tallied exactly with some grown on the adjoining land at the present day; whilst other grains found in British pits on the top of the hill, and evidently grown in an exposed situation, were so long and thin as to be mistaken by farmers to whom they were shown for an admixture of wheat and oats; but on closer examination they proved to be genuine wheat, though of very poor quality. See *Excavations at Rushmore* by General Pitt-Rivers, F.R.S. Vol. I. p. 176.

¹ *Plants in Reference to Ethnology.* *Trans. Eth. Soc.*, vol. v.

² See Observations as to the probability of its thriving in France, and the *Imperial Wheat* in Huc's *China*.

as yet, been satisfactorily ascertained. Respecting this plant Mr. Crawford says—"Maize is an exclusive product of America, and was as unknown to the Old World before the time of Columbus as tobacco or the pine-apple. With a wider geographical range than any other of the cereals, it has invaded every country of the Old World from the equator to the 50th degree of latitude, and is now the bread of many millions of people whose forefathers lived in ignorance of its existence. It is extensively cultivated in the southern provinces of China, in Japan, and in the islands of the Malay and Philippine Archipelagos. Speke and Grant found it the principal corn in parts of the interior of Africa, which the feet of white man had never trodden before their own; and in Italy and Spain it was a frequent crop within fifty years of the discovery of the New World. This wide and rapid extension, maize owed to its adaptation to diversities of soil and climate, its hardihood, with consequent facility of propagation, and its eminent fecundity."¹ Mr. Crawford elsewhere lays down, as a rule, that where native names are given to cereals, it is a proof that they are indigenous to those countries; but in applying this rule to maize, he says—"The name as known to European nations is taken directly from the Spanish, and it is to be presumed that the conquerors of the New World, borrowed it from one of the many languages of that continent. In some of the Oriental languages we have specific names for it, which seem entirely native, such as *bhutta* in Hindu, *jagung* in most of the languages of the Indian Archipelago, *katsalva* in the Madagascar. This would lead to the belief that the plant was indigenous where such names are given to it; but the probability is, that they were taken from some native plant bearing a resemblance to maize. Thus in the two principal languages of Southern India, maize is named after the chief millet cultivated in the peninsula, the *cholu* or *ragi*, to which an epithet implying its foreign origin is added. The Turks give it the name

¹ *Plants in Reference to Ethnology. Trans. Eth. Soc., vol. v.*

of *boghdai misr*, or the wheat of Egypt, which is not more amiss than the names given by the French and English when they call it Indian and Turkey corn."¹ It does not seem incredible that maize should have been cultivated in Italy and Spain within fifty years of its discovery; but why it should have been called from the first *Turkish* or Indian corn, requires explanation; neither can we understand how it found its way so quickly into China, Japan, Madagascar, the Malay Archipelago, and all parts of Africa (for it was also *found* in cultivation at the Cape at its first discovery, even as in the interior by Speke and Grant, and at Angola as recorded by Mr. Monteiro) before any intercourse had been established between those countries and Europe or America.

A gentleman from the gold-fields of South Africa informs me, that the Kaffirs beyond the frontier, who will not permit a white man to enter their territory, from the superstitious belief that the destruction of their race would follow immediately in his footsteps, yet cultivate maize largely, and have done so from time immemorial. It may also be interesting to observe that the same people describe minutely gigantic ruins existing in their land, the origin of which they do not know, but which many colonists believe to represent the Ophir of Scripture, but which no European has yet been able thoroughly to explore, so vigilant are the natives.²

Columbus is said to have introduced maize into Spain in 1520, but it is a singular fact that the old black-letter book, entitled *A Nieuwe Herball*, translated by Henry Lyte, Esq., and published in London in 1578, gives a very full description of this plant, but without any reference whatever to its American origin. It is there said, "This grayne groweth in Turkie, wher as it is used in time of dearth." "They do now call this grayne

¹ *Plants in Reference to Ethnology.* *Trans. Eth. Soc.*, vol. v.

² These ruins are figured in Baines' *Gold Regions of South-Eastern Africa*, and have lately been more fully described by some members of the British South African Expedition.

Frumentum Turicum and *Frumentum Asiaticum*; in French *Blé de Turquie* or *Blé Sarazin*; in High Douche, *Turkie Korn*; in English, *Turkish corn* or *Indian wheat*." If we compare with this the following extract from Dr. Daubeny's *Lectures on Roman Husbandry* (1857), we shall perhaps come to the conclusion that the name *Asiaticum* for that which we call *Turkish* or *Indian wheat*, may not after all be so very far wrong. Dr. Daubeny says, "The names given to wheat by Pliny were *far adorem*, *halicastrum* and *zea*. Although in modern books on botany the name *zea* is applied to maize, it certainly could have no relation to that now well-known article of food. For there can be no sort of doubt that maize is indigenous in America, and was not known in Europe till after the discovery of the New World. It is thought, indeed, that it is a native

- ✗ of Paraguay, where a variety is found differing in some respects from the cultivated kind, but not so essentially as to be regarded as a distinct species. Sir Wm. Hooker, however, relates a curious circumstance, namely, that some grains called mummy wheat were sent him from
- + Egypt, which proved to be maize, and maize of that variety which comes from Paraguay. It was reported to have been taken from a mummy, on as good authority perhaps as most of the specimens which have been brought over, a fact that ought to render us cautious in believing the reports of the Arabs in similar cases, for it seems next to certain, that some fraud must here have been practised, as a valuable plant like maize, if ever known in Egypt, could not fail to become general, in a country so well suited for its cultivation. Nevertheless, it is certainly curious that it should have been, not the commonly cultivated variety, but the one indigenous in Paraguay, which was passed off among the contents of an Egyptian tomb." In a note it is explained that "Monsieur Rifault, a French traveller, reports that he obtained these grains of maize himself, from an Egyptian catacomb."¹ In Chambers's *Encyclopædia*,

¹ *Lectures on Roman Husbandry*, by Charles Daubeny, M.D., F.R.S., M.R.I.A., Professor of Botany, Oxford, 1857.

we are told that although maize is supposed to have been unknown in the Eastern hemisphere before the time of Columbus, yet a representation of the plant is found in an ancient Chinese Book in the Royal Library in Paris, and some grains of it are reported to have been discovered in ancient houses in Athens. Indeed, I feel sure that if archæologists will look with unprejudiced eyes, they will yet find representations of this plant among the sculptures of Egypt and Greece.

To the objection that had this corn been known to the ancient Egyptians it would have become generally cultivated, it may be answered, that supposing it to have been of foreign origin, the conservatism of the Egyptians would have prevented its speedy adoption, and a land which produced so abundantly the superior grains, wheat and barley, would not be likely to resign them for that which the *Nieve Herball* says was in 1578 only cultivated in Turkey in time of famine, and of which it proceeds to say—"There is as yet no certain experience of the natural vertues of this corne. The bread that is made thereof is drie and harde, having very small fatnesse or moysture, wherefore men may easily judge that it nourisheth little and is evill of digestion." We can, however, readily understand that it would spread quickly, and be a great boon in those tropical lands unsuited for the production of wheat; but even now, after the experience of centuries, Europeans, except in Spain and Italy, cultivate this grain very sparingly, and rather as food for cattle than man.

This question as to the knowledge of maize in the Eastern hemisphere prior to the time of Columbus, is most important in connection with the intercourse which many ethnologists believe can be proved to have existed between the Old World and the New, long ages before the birth of history. With regard to American agriculture, Sir John Lubbock says—"American agriculture was not imported from abroad. This is proved by the fact that the grains of the Old World were entirely absent, and that American agriculture was

founded upon the maize, an American plant.”¹ But to this it may be replied that adventurers from the Old World, whether driven accidentally to the New, or finding themselves there in the course of a voyage of discovery, would not carry with them grain for the purposes of cultivation, but being conversant with the growth of corn, would seize upon that which they found ready to their hand as the basis of their agriculture. Even had they conveyed with them wheat, they would probably have consumed it, or have found it unsuited to the soil of the new country.

American legends are unanimous in ascribing the introduction of agriculture to foreigners coming from the sea, who are minutely described as white, bearded men, distinct in race from the aborigines. Both Quetzalcoatl in Mexico, and Manco Capac in Peru, are distinctly venerated as instructors in the art of the cultivation of maize, and although attempts have been made to prove both these to have been sun myths, I believe the balance of probability is in favour of their being real personages, notwithstanding the myths which have since accumulated round them; and the truth of the legends relating to the cultivation of maize in America, appears to me to be confirmed by the description given by Sir John Lubbock of the early traces of American agriculture. After describing these traces as consisting of irregular corn-hills, he proceeds to say—“But Mr. Lapham has found traces of an earlier and more systematic cultivation, in low parallel ridges, as if corn had been planted in drills; they average four feet in width, twenty-five having been counted in the space of one hundred feet, with a walk of about six inches between them; they are found in the richest soil in patches of different sizes, from twenty to one hundred or even three hundred acres; they are found in several other parts of the State of Wisconsin, and are called garden-beds. The garden-beds have long been replaced by the irregular corn-hills, yet according to Lapham the former are more modern than

¹ *Prehistoric Times*, 2nd ed. p. 278.

the mounds, over which they are sometimes carried." Hence Sir John Lubbock traces four long periods—"1st. That in which from an original barbarism the American tribes developed a knowledge of agriculture and a power of combination. 2nd. That in which for the first time mounds were erected and other great works undertaken. 3rd. The age of the garden-beds, which were probably not in use till the mounds had lost their sacred character, or they would not have been used for cultivation. 4th. The period in which man relapsed into partial barbarism, and the spots above-named relapsed into forest once more."¹

Now it is evident from this extract, that three different agricultural systems have prevailed among the civilized races of America; the latest, that of the irregular corn-hills, belongs without doubt to a comparatively modern period, and to the cultivation of maize, which is still planted in small hillocks by the Americans, and by those who have learnt the cultivation of this grain through them; the second, that of the garden-beds, which, though much older, yet dates only to a time when the cities of the great mound-builders had already fallen into decay, or when the builders had been supplanted by a new race, and these garden-beds probably bear witness to the cultivation of some other grain than maize, perhaps a millet, which was certainly cultivated by some American tribes; whilst of the third or oldest, that under which the mound-builders lived and executed their gigantic works, no traces remain, probably because the agriculture then practised did not include any of the cereals, but consisted solely of roots and plants, such as still constitute the food of the South Sea Islanders, and of the aborigines of many other lands, the wilder and more barbarous tribes contenting themselves with such things as grow spontaneously, whilst the more advanced cultivate such plants as are by them most highly esteemed.

The manioc or *Jatropha manioc*, says Mr. Crawford, formed the principal bread of the rude inhabitants of

¹ *Prehistoric Times*, pp. 274—277.

native America, who had but one of the cereals, and that one not universally known and cultivated. Similar plants, we are told, form the chief food of many African tribes, and there seems to be sufficient evidence to prove, that prior to the knowledge of the cereals, roots, prepared by pounding, maceration, and dessication, formed the universal food of the human race, and that the cereals were everywhere introduced by new and superior races, who had by some means acquired a knowledge of them in the land of their nativity.

There is a singular passage in Herodotus, which tells us of a time when the Egyptians lived in this primeval state on roots and fruits. After enumerating a great many points in which the Egyptians differ from other nations, he writes—"Others feed on wheat and barley, but it is a very great disgrace for an Egyptian to make food of them, but they make bread from *spelt*, which some call *zea*."¹ And later he says of those who live in the morasses—"But to obtain food more easily they have the following inventions: when the river is full, and has made the plains like a sea, great numbers of lilies, which the Egyptians call lotus, spring up in the water; these they gather and dry in the sun, then having pounded the middle of the lotus, which resembles a poppy, they make bread of it and bake it. The root also of this lotus is fit for food, and is tolerably sweet, and is round and of the size of an apple. There are also other lilies, like roses, that grow in the river, the fruit of which is contained in a separate pod, that springs up from the root in form very like a wasp's nest; in this there are many berries fit to be eaten, of the size of an olive-stone, and they are eaten both fresh and dried. The byblus, which is an annual plant, when they have pulled it up in the fens, they cut off the top of it and put to some other uses, but the lower part that is left, to the length of a cubit, they eat and sell. Those who are anxious to eat the byblus dressed in the most delicate manner, stew it in a hot pan and then eat it." It is somewhat singular that not only do the

¹ *Herodotus*, Bk. ii, 92 and 36, Cary's ed.

Egyptians resemble the Chinese in many of those points in which Herodotus points out their difference from other men, but also in the food thus consumed presumably by the lower classes, for M. Huc says—"Water-lilies, yellow, white, red, and pink, are much cultivated; the seeds are eaten as nuts, and boiled in sugar and water; the root is always excellent and wholesome however cooked, whether pickled with salt and vinegar to eat with rice, or reduced to powder and boiled with milk or water, it is very agreeable, or eaten raw like fruit."¹

Thus we see that in the two countries noted above all others for the cultivation of the cereals, there are evident traces of a time when the aborigines lived as savages do now upon roots. *Root-eater*, we are told, among the Malays is a term of contempt equivalent to *barbarian*, and doubtless it acquired this significance from the fact that the aborigines everywhere, either from old custom or from superstition, prefer the food of their forefathers. Thus we find even to the present day, the natives of Australia and the South Sea Islands prefer their taro, yams, and manioc to the cereals, which, although now long familiar to them, are not extensively cultivated by them.

Perhaps the record of the sums expended in purchasing radishes, onions, and garlic for the builders of the Great Pyramid, and the absence of all mention of corn, may also be adduced as a proof of the truth of the statement of Herodotus, the *luxuries* above-named being doubtless supplemented by the abundant lotus crop of the Nile. But then the question arises, what became of the vast quantity of corn grown in Egypt? It was, doubtless, partly consumed by the sacerdotal and military castes; much was stored, as we know, for seasons of scarcity; and much, perhaps, was exported in exchange for such articles of luxury as Egypt did not produce, until gradually but surely the taste for bread became universal among them, even as, among ourselves, wheat has only gradually, and within the last century, entirely superseded

¹ Huc's *Chinese Empire*.

the barley, rye, and oat bread familiar to our ancestors, and which is still eaten in Germany, Russia, and Scotland.

It is a point especially worthy of note that races, however low they may be in the scale of humanity, have yet learnt to prepare native plants, many of them of a poisonous nature, and others of an acrid and unpleasant taste, by soaking them long in water, by pounding and drying them so as to extract the unwholesome matter, whilst retaining the starch, which they then make into a paste and either bake or boil, but chiefly the latter. Du Halde tells us that the wheaten bread of the Chinese is chiefly prepared by boiling.¹ Even our Saxon ancestors retained a memory of the arts of savage life in the food they prepared from acorns, by pounding and soaking them long in water, to remove that bitterness which would seem to us to render them hopelessly unpalatable.²

The three nations of antiquity most celebrated for their knowledge of agriculture, confining that term to the cultivation of the cereals, are China, Egypt, and Peru, but in each of these there are traces of a time when these cereals were unknown, and in each their introduction is distinctly ascribed to individuals who are likewise the founders of the nation, and of the highly-developed civilization subsequently attained. In China this teacher of agriculture was not Fohi, but the second emperor, or head of the second dynasty; some historians reckoning seventeen emperors between him and Fohi. The annals of China, indeed, seem to bear out in a remarkable manner the theory of the gradual development of civilization insisted on by modern ethnologists. In the time of Fohi, men are represented as differing but little from brutes, devouring every part of an animal, drinking the blood, and clothing themselves with skins; but Fohi taught them to make nets for

¹ Du Halde's *Hist. of China*.

² The fact that maize becomes more wholesome and palatable after long soaking in water and boiling, may perhaps account for its common use among the lower races.

fishing, and to bring up domestic animals for food and sacrifice ; also he instructed them in music, and to use the eight koua, or symbols of three lines each, instead of the quipus or knotted cords ; he also regulated the laws of marriage, forbidding a man to marry a woman of his own name, whether related or not. Then Chin-nong introduced agriculture, inventing the necessary implements of husbandry, and teaching the people to sow five sorts of grain ; and this he did, it is said, because the people had greatly increased, and the plants and animals were not sufficient for them. From hence he was called Chin-nong, which signifies Heavenly Husbandman.

The five kinds of grain introduced by Chin-nong are still sown yearly by the Chinese Emperor at the great agricultural feast ; they are wheat,¹ rice, millet, beans, and another kind of millet called Cao leang, which is, I understand, that sort of corn called Guinea corn, or Caffre corn, which is so widely cultivated in Asia and Africa ; but Du Halde probably speaks of maize when, in describing the second government of Tartary, he says—"They have in particular a great quantity of millet, and a sort of grain unknown amongst us, called by the Chinese of the country mai-se-mi, as being of a middle species between wheat and rice, but whatever its proper name be, it is of a good taste and in great request in these cold countries. It would, perhaps, thrive in some places in Europe, where no other grain will."²

✓ In Egypt the inventor of the art of agriculture was Menes, the first earthly monarch ; in Peru it was Manco Capac, whose wife and sister, Mama Oello, was the instructress in the arts of spinning and weaving. The analogies to be traced between the civilizations of these three countries are too numerous to be noticed here, but it must be observed that the great festival of the search for Osiris appears in China, where it is referred to a much-esteemed Mandarin who was drowned, and

¹ Du Halde's *History of China*, vol. i. p. 270 *et seq.*; vol. iv. p. 94.

² *Ibid.* vol. i. p. 270.

in whose honour a yearly feast was instituted with small gilt barks moving on the waters in search of the Mandarin, with sports, feasts, and fights upon the river.¹ The feast also of Isis is represented, but, as it would appear, in the form of a survival. On the day that the sun enters the fifteenth degree of Aquarius, which is the commencement of spring, a feast is held in honour of husbandry and celebrated husbandmen; numerous figures in connection with this art are carried in procession, and among them a huge cow of clay, so large that forty men can with difficulty carry it; behind this cow, whose horns are gilt, is a young child with one foot naked and the other covered, representing the genius of labour and diligence. The child strikes the earthen cow without ceasing with a rod, as if to drive her forwards. She is followed by all the husbandmen with musical instruments, and by companies of masquers. At the governor's palace this cow is broken in pieces, and the fragments, with a number of small cows taken from the larger one, are distributed to the multitude, whilst the governor makes a discourse in praise of husbandry.² The evident connection between this ceremony and the festival of Isis represented in Greece by the wanderings of Io, and its analogies in Indian mythology, must strike every ethnologist, and there is one point in it of peculiar interest, which is its connection with moon-worship in reference to agriculture.

It has been said by Sir John Lubbock that agriculturists worship the sun, and hunters the moon; this, however, is only partially true, for we find among agricultural races a triad representing the sun, the moon, and the earth. Wherever stone or brick pyramids are found, and it must be remarked that they are found only among agricultural, and, therefore, semi-civilized, races, the largest is dedicated to the sun and the second to the moon. Moon-worship in America Mr. Bancroft appears to assign to a later date than sun-worship, and thinks it has reference to that crescent land from which so many of the American tribes derive their mythical

¹ Du Halde's *History of China*, vol. i. p. 210. ² *Ibid.* vol. ii. p. 119.

origin; but in China, in Egypt, and throughout the east, the moon appears to have been the older deity, and to stand out distinctly as the especial goddess of agriculture.¹ The importance of the sun and the earth to agriculturists is easily understood, but why the moon should hold so prominent a position as the female or productive element in nature is not so clear. In our cold northern clime we have come to look upon the moon simply as a light-giver and regulator of the tides, and to regard the ancient belief in her influence upon vegetation as a superstition long exploded; nevertheless it would appear that in warmer climates the influence of the moon is not altogether mythical. A gentleman long resident in the West Indies informs me that the growth of the sugar-cane during moonlight nights so greatly exceeds that which takes place when the moon is not visible, that planters arrange their plantings so as to secure moonlight for the young canes. The knowledge of this fact probably regulated the great agricultural feast in China, which was always on the twenty-third day of the moon, thus securing to the young plants the full influence of the moon during the early stages of their growth. The observant Chinese also attach great importance to a fact unknown to us, namely, that some sorts of grain flower invariably by night, and others by day.² The sign taught to Chinese children as symbolical of the moon is a rabbit pounding rice in a mortar,³ and this sign, when compared with the prominence given to the rabbit in American sculptures and hieroglyphics, seems an additional argument in favour of a connection between the hemispheres in prehistoric times, especially if, as Buffon says, that animal is not a native of America. It appears eight times on each face of the pyramid of Xochicalco (Mexico), in conjunction with other unexplained

¹ It would appear to me that moon-worship originated with agriculturists, and sun-worship with metallurgists.

² See Du Halde, vol. iii. p. 2.

³ Among some aboriginal tribes in India the word for moon is the same as that for hare and roebuck.

signs.¹ Bancroft reports it as among the rock carvings of Utah, and it forms the first sign of the Mexican calendar, the close resemblance of which to those of China and Tartary, has always been held as a strong argument for former intercourse between the widely-separated peoples using them.

I believe it may be proved that the introduction of the arts of civilization, and particularly that of metallurgy, may be traced to a race of sun and serpent worshippers, having strong affinities with the Chinese, Egyptians, and ancient Accadians, a race which it is the custom to term Turanian. This race, which, however it may be denominated, was certainly pre-Aryan, may, I believe, be credited with having carried the seeds of useful knowledge over the earth within a certain zone. Agriculture, weaving, pottery, pyramidal structures, and metallurgy may be attributed to them, although of course it does not necessarily follow, that all these arts were invented at once, or spread at the same time over the surface of the globe, but the strong resemblances to be traced everywhere in the primitive stages of these arts, and the peculiar religion which invariably accompanies them, of which I shall treat later, in which the serpent and human sacrifices play a prominent part, seem to point unmistakably to the influence of one race, whilst everywhere may be traced, beneath the originators of this peculiar civilization, one or more aboriginal races, treated by the superior or dominant caste, as slaves or outcasts, yet retaining always their own superstitions, their own customs, and even, as has been shown, their own food, which in some cases appears to have been prohibited to the newer race, as, according to the statement of Herodotus, beans were forbidden to the priestly caste in Egypt, although forming the chief food of the aborigines there, as they did also in America and South Africa.² Pythagoras also forbade beans to his followers, deriving his notions from Egypt.

¹ See also Tylor's *Anahuac*; and Bancroft's *Native Races of the Pacific*.

² The Kafirs still cultivate sparingly a peculiar bean which, once formed a staple article of food among them.

A dissertation upon primitive agriculture would evidently be incomplete without some notice of the modes of agriculture and the implements employed in early times. Singularly enough, although ears of corn, grain of so many kinds, and even seeds of raspberries, have been distinguished among the relics of the Swiss lake dwellers, hitherto no agricultural implements have been discovered. It is probable that the implements employed by early agriculturists were of the simplest form possible—that, in fact, they were only pointed sticks used to scratch the surface of the ground. Such sticks, used as picks or hoes, are represented on Egyptian monuments; and pointed sticks are still the sole implements of some savage tribes; although they appear to be used by them somewhat differently from the Egyptian *sarcle*.

The Bushmen use a stick loaded with a perforated stone for digging; and in a notice of New Guinea, by the Rev. S. Macfarlane, as reported in the *Sydney Morning Herald*, of May 27, we find—"A large plot of land is turned over very systematically and quickly by a number of men standing in a row, with a pointed stick in each hand, which they raise and plunge into the ground simultaneously, and then use them as so many levers to turn over the soil. It is surprising how quickly they can turn over an acre of soil in this way."

Bancroft describes the nearest approach to the plough among the Nahua natives of America, as being sticks, often tipped with copper, and there can be no doubt that the primitive plough was simply a pointed stick dragged through the ground by men, so as to form a furrow. Such a plough is represented on the Egyptian monuments, differing from the *sarcle* only in having a cross-piece of wood for a handle, to which was attached ropes whereby it was dragged along by four men. The old Roman plough was but little better than this, excepting that the share was of metal, and even to the present day in India, China, and it may be said the whole of Asia, the ploughs used differ very slightly from the early Egyptian type. In America, we are

told, that the natives still use, without improvement, the old Roman plough as introduced by the Spaniards, whilst in South Africa ploughs were unknown until the advent of Europeans, and are only just coming into use among the natives, whose sole agricultural implement, in addition to the digging-sticks described above, was the hoe, an implement described by Burchell as resembling the adze or pecklo, but larger, which the women, who alone till the ground, raise above their heads, bringing it down with great force upon the hard sun-baked earth, thus merely breaking the earth irregularly, and putting in the seed.

The hoe described by Mr. Monteiro as the sole agricultural implement in use among the natives of Angola,¹ where also women are the only agriculturists, is made of iron, resembling an oyster-shell in shape, with a short spike burnt into the knobbed stick which serves as a handle, and some of these are made with a double handle, so as to be used by two women at once. These hoes strongly remind one of the Mexican axes described by Tylor,² who says that, notwithstanding the skill displayed in knife and arrow making, the Mexicans "never discovered the art of making a hole in a stone hammer. The handles of the axes shown in the picture-writing are clumsy sticks, swelling into a large knob at one end, and the axe-blade is fixed into a hole in this knob." Dr. John Evans, in his work on *Ancient Stone Implements*, has pointed out that it is probable that many of the so-called stone celts, especially those of large size, may have been hafted in this manner, and used as hoes; but if the implements of the Swiss lake-dwellers were as simple as those described, it would be difficult after so many ages to distinguish the pointed stick used for ploughing or pecking up the soil from those used in the construction of their dwellings. It also appears possible that the innumerable flint flakes found among pre-historic relics may have been used in a

¹ See *Angola and the River Congo*; J. Monteiro, and Burchell's *South Africa*.

² Tylor's *Anahuac*.

wooden frame, as they still are in the *tribulum* of the East, and as Dr. Daubeny¹ tells us they were used in Gaul at the time of the Roman Conquest, as harrows or threshing-machines. The same writer also describes a large hollow frame armed with teeth, which served the purpose of a modern reaping-machine, and which may likewise have represented a pre-historic implement. Mr. Flinders Petrie has recently discovered in Egypt a primitive sickle, consisting of a wooden frame resembling a jawbone, into which has been inserted a number of sharp flint flakes like a saw.

The employment of women in agricultural pursuits seems to have been continued from superstitious motives in semi-civilized countries, and prevails even now in China. According to M. Huc,² it is no uncommon sight to see a plough drawn by a woman, her husband walking behind to guide it, whilst the great agricultural festival in China, the use of terraces on the mountain sides, and the attention paid to irrigation, serve to connect the agricultural systems of China and Peru so closely, that Mr. Tylor appears to ascribe these usages in Peru to a Chinese colony. The use of ridges in agriculture seems to have been universal. Not only do they distinguish the garden-beds in America, but Rennie describes them as underlying peat mosses in Scotland, where wheat cannot now be grown; and Dr. Daubeny tells us that among the Romans the corn was sown on ridges in wet soils, and between them on dry soils.³ The American corn-hills, described as used for the cultivation of maize, seems to be peculiar to that country, and although they have been adopted by some Europeans at the Cape, the natives still sow maize on level ground; nevertheless Mr. Monteiro describes the use of little hillocks in Angola for planting the mandioca.⁴

¹ *Six Lectures on Roman Husbandry*: Chas. Daubeny, M.D., F.R.S., &c.

² Huc's *Chinese Empire*, ii. p. 303.

³ Daubeny's *Lectures on Roman Husbandry*, and Rennie on *Peat Mosses*.

⁴ See *Angola and the River Congo*, p. 205, J. Monteiro.

It is a difficult task to gather up the scattered threads presented to us by the study of Primitive Agriculture, but the somewhat meagre facts I have been able to collect appear to me to confirm the general conclusions of modern ethnologists. We see everywhere primitive man, a naked savage, devoid of every art excepting those necessary to self-preservation, his first improvements being the manufacture of implements of war and the chase. Man in this condition would seem to have spread gradually over the whole earth, for his relics are found everywhere, and his descendants, still in the same state of utter barbarism, are found in many outlying lands which have been cut off by changes in the conformation of the land from communication with races who have gradually acquired civilization; and may also be traced in low and outcast tribes down-trodden by conquering hordes.

The origin of civilization, like the origin of races, remains an unsolved problem. From the similarity to be traced in the monuments, myths, customs, and religions of all early civilized or semi-civilized peoples, I have been led to the conclusion that it was never independently acquired, but was the result of constant intercommunication by channels long since become impracticable, and when this intercommunication ceased, we find civilization arrested, as in America and China, and only continually and increasingly developed among nations who from war and commerce have kept up continual and constant intercourse with each other. There can be little doubt that the first great stimulus to civilization was given when man, driven by necessity, began to till the ground. The first successful efforts in this direction would lead naturally to others; but roots and fruits were evidently cultivated long before the cereals, and this early stage of agricultural knowledge is still represented among the South Sea Islanders, and among some of the lower aboriginal peoples of Asia, Africa, and America, although it is vain to conjecture when and where it first arose.

The cultivation of the cereals, however, represents a

ce in agricultural skill; but that this also at a very early period, the records of Egypt and the relics from the Swiss lake-dwellings prove; and that it was not acquired independently by the lake-dwellers is evident from the fact that corn found with that grown in Egypt. The earliest acquirement of agriculture in America is affirmed by many, but I venture to believe it to be yet proven. The absence of wheat and barley proves nothing, for the earlier civilizations of America were confined to tropical and semi-tropical regions, where these grains if introduced would not supersede maize, which there grows to perfection. It must not, however, be forgotten that all American legends—and legends usually have some basis of fact—unite in ascribing the cultivation of maize, as well as other customs wherein the civilized races of America resemble the ancient civilized races of the Eastern hemisphere, to foreign civilizers entering the country from the sea; and if maize be indeed indigenous to America, its presence in Asia and Africa prior to the time of Columbus, if proved, as I believe it can be, would go far to establish the fact of an intercourse subsisting between the hemispheres in prehistoric times. Nor must we forget, that the absence of cereal agriculture in those islands which may be supposed to represent the ancient stepping-stones between the continents, may be accounted for, by prejudice and superstition, since the natives even now grow cereals very sparingly, whilst the cultivation of maize among races quite as low in the human scale in Africa, Madagascar, and New Guinea, would seem to point to the plant as a native of those regions as well as America, or to the extreme antiquity of its introduction to the Eastern hemisphere.

CHAPTER VIII.

THE SERPENT IN CONNECTION WITH METALLURGY.

Metallurgy next to Agriculture as a Civilizing Agent—Gold the first Metal used—The Use of Copper—Commercial Inter-course consequent upon Metallurgy—Serpent Worship—The Good Serpent always connected with the Precious Metals—Totemic Origin—Do they really store Glittering Things?—The Nagas of India and of Egypt—Cadmus—Quetzalcoatl—Osiris—Silver—Smelted Metal probably unknown—Indian Legend—Melted Gold conferring Immortality—The Serpent Myth in America—Atlantis.

NEXT to a knowledge of agriculture, which can be traced back to neolithic times, the metallurgic arts have been the most potent aids to the civilization of mankind. Undoubtedly gold was the first metal known, and its use may date back to the Stone age, for as it is found in a pure state in many countries, it would probably be seized upon for ornamental purposes by savages, who would soon learn that it might be beaten into shape with a stone hammer; but, singularly enough, the first definite traces of metallurgy show the art in an advanced stage, in which the metal used was bronze—a compound metal requiring much skill in the manufacture, and a considerable commerce to obtain the copper and tin necessary for making it; and this presupposes a knowledge of the art of navigation, for copper and tin are not to be found everywhere, and there is reason to suppose that the early workers in bronze, coming from the East or from the shores of the Mediterranean, sought their tin in Britain, and carried the knowledge of the art of smelting and welding metals over a considerable part of the world.

Archæologists look back to a period before the age of bronze, in which pure copper was used, beaten out, and not smelted or mixed with alloy; and it is indeed found that some of the earlier metal implements classed as bronze consist in reality of unalloyed copper, the requisite strength being obtained by beating together several thin layers of metal and lapping over the edges. This, which may be regarded as the earliest form of metal work, is found in some of the Swiss lake-dwellings; also among those curious discoveries recently made in Spain by the Belgian brothers Siret; among the Egyptian finds of Mr. Flinders Petrie, as well as in American mounds, and among the Eskimo. It is with these early metal workers that we first meet with that singular and very wide-spread religion known as serpent worship.

Among the very early hunters and cave-dwellers of paleolithic and neolithic times there is no prominence given to the serpent, although, as I shall show later, they do not appear to have been wholly destitute of religion. But presently from these caves emerges the serpent—not a thing of evil, carrying with it death and destruction, but a bright and glorious form adorned with a royal crown of glittering gems; and as he glides majestically over the earth man follows in his track—no longer the wild hunter, content with rude stone weapons of the chase, but before him he pushes the ploughshare deep into the bosom of the virgin soil. In his hand he bears a metal sickle wherewith to reap the primal harvest, and turning his eyes to the bright luminary above him, he bends his knee and worships the source of light and life, and says to the stones beneath his feet, "Ye are like my earth-mother of old, dark and sterile, until the bright sun-god looked upon her and sent his messenger the serpent to teach her children wisdom."

Little as we know of the religion and habits of thought of our remote ancestors, the innumerable legends which have descended to us in which the serpent plays an important part, cannot fail to strike us

as very remarkable, especially when we note the strange persistency with which he and the gods, of whom he is the emblem, are associated with agriculture, wealth, power, honour, gold, and gems; and strange to say, the deeper we delve into this mysterious past, the more numerous and important do these serpent legends become, bringing to our view whole tribes who were supposed to be half serpents—kings and heroes of semi-serpentine descent, and gods either serpentine in form, or bearing the serpent as a sacred symbol; and it is a strange fact that all these gods and men thus singularly connected with the serpent have also *always* some inexplicable relation to precious stones, the precious metals, the dawn of science and ^{Influence} agriculture.

The mediæval dragon was always the guardian of hidden treasures in classical times; it was the dragon who guarded the golden apples of the Hesperides, and the semi-serpent Cerberus watched over Hades, the kingdom of Pluto and realm of Wealth. Going back farther still, we find Hoa, one of the chief of the Chaldæan gods, whose emblem is a serpent, called also the layer-up of treasure. ~~where worth go~~

Indra, the old aboriginal god of India, is worshipped to this day as the giver of wealth, which wealth is guarded by serpents. Kneph and Osiris in Egypt, both symbolized by serpents, are also gods of wealth; the former represented as the potter forming Hephaestus or Vulcan; whilst in the far-off region of Mexico, Quetzalcoatl, the serpent, is regarded as having taught metallurgy and agriculture to the people.

When, therefore, we find in so many widely remote nations traces of unaccountable reverence for a deadly reptile, and side by side with it evident signs of the rudiments of metallurgy blended with traditions which, however distorted, may yet be deemed a survival of prehistoric beliefs, and which all point to the serpent as the revealer of knowledge and the guardian of hidden treasure, we may, I think, assume that in some mysterious manner the serpent had something to do with the first knowledge of metals. The animals revered of old were

those which had in various degrees rendered themselves useful to man; and it seems unreasonable to suppose that this deadly reptile would have been exalted to so high a place in the mythology of all nations, unless he had rendered some service to mankind. The veneration for the serpent doubtless originated in an age of Totemism, when animals were invested with human attributes, and the clan to which they were sacred, looked upon themselves as in some sort their children, calling themselves snakes, or eagles, or stags, according to the totem adopted.

It appears to me not improbable that the first to adopt the serpent as a totem may have been led by some dream to find treasures of gold and gems in a cave, in which he also found the snake apparently guarding the treasure, and hence the persistent stories handed down from generation to generation, for who can say how many centuries, in which the serpent is always represented as the guardian of hidden treasure in every country to which that early serpent tribe conveyed the knowledge of metals. *Other Aesop's fables.*

Whether snakes, like some other animals, do really hoard glittering objects, I do not know, and the only notice of such a propensity I have met with, is the following from Beaufort's *Egyptian Sepulchres and Syrian Shrines*—“There was an old bag of a woman at Tadmor, much thought of because she had twice made the pilgrimage to Mecca. One day when she saw me busy cleaning a pretty pebble I had found, she began, ‘Oh, lady! I have found something much prettier than that; it must needs be a stone belonging to some jinns, for I never saw anything like it before. She told us that she had been out one day among the ruins of Zenobia’s palace about midday, when the sun being very hot, she sat down by a low wall to rest. Presently she heard the hissing of serpents close to her, and turning her head to look over the wall, she saw at a few yards off two serpents fighting; their heads were curved far back as their bodies glided and wriggled about facing each other; and every now and then they would dart

like lightning one at the other, each trying to seize his enemy's head. At last one gave the other a mortal bite, and he fell prostrate and bleeding on the sand. Then she made a noise, and the victor glided frightened away, while she went to look at the dead snake, curious to see for what they had been fighting. And lo! out of his mouth came the apple of discord—this little white stone!—and she opened her hand and showed me a large round pearl, a costly one in any place, but doubly valuable with this marvellous tale attached to it.”¹ The Bedouins did not know it was a jewel, nor had any of them ever seen a pearl before.

The Sheikh said, that although the old woman was a great rhodomontader, he did not think the story of the serpents untrue, for he had himself more than once seen serpents fighting in the manner she described, for some such article as a bit of stone.”² *in Nesi'mi'sh'ar? 9*

Old Indian sculptures represent Krisna standing upon the conquered serpent holding a gem in his hand, as though that had been the prize of victory, whilst a ball or gem of the same kind adorns the head of the snake; and the sacred snake of the Mexicans is similarly adorned. Perhaps also the Druidical serpent's egg and the Popo beads of Dahome may point to the fondness of snakes for glittering objects.

In any case it seems clear that the first metal workers belonged to that ancient pre-Aryan race denominated Turanian; but perhaps more correctly Mongoloid, for it is among Mongolian races that reverence for the serpent or dragon is, and always has been, carried to excess. China and Japan may be quoted as examples of this at the present day, but ancient legends tell the same tale

¹ Beaufort's *Egyptian Sepulchres and Syrian Shrines*, p. 390.

² The following, from *Three Generations of English Women*, vol. ii. p. 187, seems to denote a natural tendency in snakes to appropriate gold and gems. The tame snake “was fond of glittering things, and when Lucie (i. e. Lady Duff Gordon) took her many rings off her fingers, and placed them on different parts of the table, it would go about collecting them, stringing them on its lithe body, and finally tying itself into a tight knot, so that the rings could not be recovered till it chose to untie itself.”

of India, at that remote epoch when the Aryans crossed the Himalayas and swarmed into those great cities inhabited by tribes who were certainly not savages, but were skilful metal workers, especially in gold.

Amongst these may be specially noticed a tribe calling themselves Nagas, or snakes. These Nagas are represented in all the old Indian sculptures and paintings, with snakes springing from their shoulders, and forming a canopy over the head of the king. They appear to have long continued a powerful tribe, for when the Buddha of history (B.C. 640 or 560, or according to Huc, 960) is required to prove his divine mission in presence of the gods, two Naga kings, who seem to have become converts, presented him with a thousand-leaved lotus, the size of a cart-wheel, all of gold, with a stalk of diamond,¹ upon which Buddha seated himself, and hence is denominated the "Gem in the lotus."

In vol. iii. of *Asiatic Researches*, we find—"The king of serpents (Nagas) reigned in Chacragiri, but the Garudas (Ruchs) having conquered the Nagas, had a serpent every day for dinner, which Garuda, the eagle or Roc, obliged the king of serpents to supply. The place where the royal snake resided had the name of Câtimâ, not far from which was the mountain called brilliant, from the precious metals and gems with which it abounded; hence say the Hindoo writers, 'They who perform yearly and daily rites in honour of Sancha Naga will acquire immense riches.'"

There are legends of a similar race under the same name in Africa. The *Universal History* says—"After the reign of the gods and demi-gods in Egypt, and the kings of the cynic cycle, came another race denominated nekyes (Nagas?), a title implying royal, splendid, glorious." The mountains of snakes mentioned by Nubian geographers, were named Ophiusa by the Greeks, doubtless the Ophir of Scripture, which sometimes signified the whole of Africa.

The Greek legend of Cadmus is of especial interest in connection with this subject. Cadmus, whose name

¹ Mrs. Spiers' *Life in Ancient India*.

signifies the East, we are told came to Boeotia, where he slew a dragon sacred to Mars, which guarded a well; and by the advice of Athena sowed the monster's teeth, from which sprang armed men, who destroyed each other, until he taught them the art of agriculture, and formed them into a peaceful colony; he and his wife were afterwards transformed into serpents, and were worshipped in that form.

Now I would read this story as a very simple allegory, in which Cadmus, with a few followers coming into Greece, either from Phoenicia, Egypt, or India, and finding himself opposed by a warlike aboriginal race, at first overcame them by the superior weapons at his command, and afterwards taught them the use of those weapons, whereupon they turned their arms against each other, and were almost exterminated before he succeeded in teaching them a nobler and more peaceful use for their newly acquired knowledge. Cadmus vanquishing with the plough the dragon of Mars, is a favourite subject in Etruscan tombs, and it is somewhat significant that to him is ascribed the first working of the mines of Pangeon in Thrace, and he is reputed to have taught mining, as well as agriculture and writing, to the Greeks. Another Greek semi-serpentine divinity associated with the introduction of metallurgy and agriculture, is Triptolemus, the son of Demeter, the earth goddess; and many others, as Cecrops and Draco, might be adduced.¹

Quetzalcoatl, the Mexican serpent deity,² is represented as a benefactor who had taught the Aztecs the use and art of manufacturing metals, of which he wore a shining helmet on his head. He also taught them how to cultivate maize, of which a single ear was a load

¹ See Smith's *Classical Dictionary*: Articles, "Cadmus"; "Demeter"; "Triptolemus."

² In the curious Mexican mosaics in the Christy collection the sacred serpents are carefully marked out with beads of gold, and Torquemada says the images of the three great Mexican gods were each of a golden serpent; whilst in the mounds of the West, among many sculptured serpents discovered, there was one carefully enveloped in sheet copper.

for a man, and instructed them in the cutting of gems.¹ In Peru, Manco Capac and Mama Oello, sent by the sun to teach men the arts of agriculture, were to settle where a golden wedge they carried, sank into the ground; which legend, compared with that of the Chaldaean deity Hoà, whose emblems were a wedge and a serpent, is certainly remarkable. The name of Osiris, too, the agricultural god of Egypt, whose emblem is the serpent, is derived, according to the *Encyclopædia Britannica*, from Oshir, which signified gold. But it would appear to me that these early men-serpents, when they first quitted their Indian or Egyptian home, to scatter the seeds of civilization over the benighted West, were not acquainted with the art of smelting metals, or with that combination forming bronze, afterwards so universally used. Gold, silver, and copper, the three metals most commonly found in a pure state, were doubtless the first to come under the notice of mankind.

Max Müller points out that what makes it probable that iron was not known before the separation of the Aryan nations is, that the name for it is different in every one of their languages, whilst Sanskrit, Greek, the Teutonic and Slavonic languages, agree in their names for gold; Sanskrit, Greek, and Latin, in the names for silver; Sanskrit, Latin, and German, in their names for the third metal, probably copper.²

Silver, however, seems to have been very little used in pre-historic times, although the large quantity of this metal found in the tombs explored by M. M. Siret,

¹ Prescott's *Peru*.

² There is a legend in Grimm belonging to the Iron age which is interesting, as connecting the serpent not only with gold, but with man's soul or spirit, and the curious superstition which makes a running stream an impassable barrier to supernatural beings. The story runs—"King Gunthram lay in a wood asleep, with his head in his faithful henchman's lap. The servant saw as it were a snake issue from his lord's mouth and run to the brook, but it could not pass. So the servant laid his sword across the water, and the creature ran across it and up into a mountain. After a while it came back and returned into the mouth of the sleeping king, who waking, told how he had dreamt that he went over an iron bridge into a mountain full of gold."

in South-east Spain, proves that it was well known and much used by the unknown dwellers in that region. Although it seems probable that the early serpent race, who presumably taught the use of metals, were not acquainted with the art of smelting those metals, yet there is a curious legend in the *Mahabbarata*¹ connecting serpents with smelted metals. This is related in the third Avatar of Vishnu in the form of a tortoise, and is thus given in Maurice's *History of Hindostan*—“The good genii, wishing to obtain the amrita or water of life, went before Brahma and Vishnu, and requested their help to remove the mountain Mandar, wherewith to churn the ocean. Then he with the lotos-eye directed the king of serpents to appear. Anata, the serpent king, arose, and instructed by Narayen (Vishnu), took up the mountain and carried it to the ocean with all its inhabitants, and the Soors (good genii) accompanied him into the presence of the Ocean, whom they thus addressed—‘We will stir up thy waters to obtain the amrita’; and the Ocean replied, ‘Let me also have a share, seeing I am to bear the violent agitation caused by the whirling of the mountain.’ Then the Soors (good) and the Assoors (evil genii) spake unto Courmarajah, i. e. Vishnu, king of the tortoises, and said, ‘My lord is able to be the supporter of this mountain,’ who replied, ‘Be it so,’ and it was placed upon his back. So the mountain, placed on the back of the tortoise, was whirled by Indra like a machine.”

The mountain Mandar served as a churn,² and the serpent Vasookee for the rope, and thus the waters of the ocean were stirred up for the discovery of the amrita. The Assoors were employed at the serpent's head, and the Soors at his tail, whilst Anata stood by Narayen. The serpent thus pulled violently backwards and forwards, vomited forth a continual stream of fire and smoke and wind, which ascending in thick clouds mingled with lightning, began to rain down upon the

¹ The *Mahabbarata* is supposed to be 4000 years old.

² Maurice's *Hindostan*. This churn is identified by Mr. Tylor with the early implement for fire-making.

labourers, already fatigued with their exertions. The roaring of the ocean so violently agitated was like the bellowing of a mighty cloud. Thousands of the productions of the water were torn to pieces and confounded with the briny flood, and all the inhabitants of the great abyss below the earth were annihilated, whilst the forest trees were smitten together, with the birds thereon, and from their friction fire was produced, covering the mountain with smoke. The fire is at length quenched by a shower of cloud-borne water poured down by the immortal Indra; and now a heterogeneous stream of the concocted juice of various trees and plants ran down into the briny flood. It was from this milk-like stream of juices and a mixture of melted gold, that the Soors obtained their immortality.

With regard to the discovery of the art of smelting metals, it may be observed that many old geographers attribute it to a violent conflagration, which melted the ores, and caused them to flow down pure. In what way the art of metal working, with its distinctive serpent legends, was conveyed to America is an unsolved problem.¹ Many great ethnologists, and amongst them Mr. Darwin, have denied that the civilization of remote lands, and particularly that of Mexico and Peru, can be ascribed to wanderers from civilized lands, adducing in proof of their belief the small progress made by modern missionaries; but we must remember that Christian missionaries teach an *invisible* God, an abstraction not readily comprehended, whilst these ancient sun and serpent worshippers could point to the bright luminary above, and the deadly reptile at their feet, as visible and powerful divinities. We all know that the early success of Cortez in Mexico was due to his having been looked upon by the simple Aztecs as their great serpent-

¹ It may be observed that although the serpent myth does not seem fully developed in the South Sea Islands, where when discovered metals were unknown, yet in the Tonga and Fiji islands, in which there are traces of a race of superior civilization prior to the present inhabitants, we find a divinity worshipped half stone, half serpent.

god and benefactor, Quetzalcoatl, whose return they were expecting.

It certainly seems more reasonable to suppose that the seeds of knowledge were implanted by strangers according to the traditions of the people, than that they should have acquired independently a mythology, astronomical records, various arts of civilized life, such as metal-working, architecture, agriculture, and pottery, so nearly resembling those of Eastern Asia, Egypt, and Etruria. Dr. Wilson and Dr. Tylor, as well as many other excellent anthropologists, assign an Asiatic origin to these things, but the route by which they were conveyed is undetermined. To Peru the way across the calm Pacific from China or Japan does not seem impossible; but to Mexico, the most likely route would be across the Atlantic, and for this the fabled island of Atlantis seems a necessity. Atlantis has been made the subject of much controversy, and its existence is stoutly denied by most geologists, but it comes up again and again with renewed vigour, and it has always appeared to me probable that although the account of this great island and its destruction may have been greatly exaggerated, there must have been some foundation for the myth; and indeed Mr. Wallace allows an extension of land or a chain of islands, since submerged, to have stretched some distance across the Atlantic, and these may reasonably have formed stepping-stones for people who had attained to the art of navigation even in a rudimentary form.

At all events, judging from the numerous legends, from sculptures and other works of art, especially in metal, there seems every reason to suppose that the great serpent myth originated in Asia, and was thence conveyed at a very early date by pre-Aryan metal-workers to Europe, Africa, and by one or more routes to America. The subject is so curious and interesting, and the legends connecting the serpent not only with metals, but with sacred stones and gems, are so numerous, that I purpose to devote a chapter to this branch of the subject, showing how the legends have spread from land

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to land, and come down to modern times. Meanwhile it must be borne in mind that the serpent *as a totem* may have originated in many lands, and in fact is found all over the world in connection with the worship of deceased ancestors, being almost universally regarded as the receptacle of the soul, or spirit, of chiefs of aboriginal tribes; but it is in his aspect of *benefactor*, the giver of wealth, the teacher of agriculture and of the metallurgic arts, that I regard the serpent myth as of such great anthropological importance.

CHAPTER IX.¹

SERPENTS AND PRECIOUS STONES.

The Good Serpent or Dragon in Christian times—Emblem of Kingly Power—King Arthur—Owen's *History of Serpents*—Men Serpents—Moses and the Serpent—Good and Evil Serpents—The former the Symbol of Gods and Benefactors—The Midgard Worm—Indian Legend—The Serpent as Guardian of Gems—Virtues of the Guardian transferred to the Gems—Legends of Gems—Abraham and the Ruby—The *Gesta Romanorum*—The Serpent-stone, or Bezoar—Musk as an Antidote to Snake-bites—Sculptured Snakes rendered Tombs Sacred—Legends of Serpents in connection with Rude Stone Monuments—The Serpent and Sun-worship—Serpent Mounds—The Serpent Egg of the Druids, and the Mundane Egg—The Serpent Myth of Turanian Origin—Disseminated by Colonists of that Race.

ALL those who have visited the reptile house at the Zoological Gardens must have experienced, in a greater or less degree, that sensation of mingled loathing and fascination which the sight of the writhing, hissing, double-tongued monsters contained therein commonly excites in all beholders. "Cursed art thou above cattle, and above every beast of the field," seems to spring spontaneously to the lips, yet probably at least half of those who are so ready to use the words of the curse, bear about their persons, either in pin or ring, necklace or bracelet, or ear-ring, the semblance of the reptile they look upon with so much abhorrence. The lady places upon her finger, and the gentleman upon his breast, a jewel of price set in the head of a golden serpent, the valued gift probably of a lover or friend, who would

¹ Reproduced in part from *St. Paul's Magazine*.

symbolize thereby the eternity of his or her attachment. "The serpent with a ruby in its mouth" has always been a favourite love-token, doubtless at first employed as a charm, with a deeply mystical meaning; but the modern jeweller, as he fashions the scaly monster to adorn the finger of the dainty lady or the breast of the warrior, little dreams that he is perpetuating one of the oldest superstitions of the heathen world. Had he lived in those remote ages, the lady and her lover must have been content without the coveted jewel, for the venerated form of this deadly reptile was sacred to the gods, and adorned only the images of divinities and their attendant priests, or the sovereign, who was himself looked upon as divine. He might indeed have been called upon to make a collar of gems; but it would have been to adorn the neck of the living reptile—the gift, not of a lover, but of a devout worshipper of the divinity enshrined within the writhing folds of the pampered serpent, for one of the curious anomalies in the history of this deadly reptile is, that it has ever been looked upon as god-like in all countries, the symbol of power and dominion, the revealer of hidden knowledge, the guardian of hidden treasure, and the emblem of good and beneficent gods, until gradually it became changed both in form and character, and, as the dragon, is now looked upon in Christian countries as the emblem of sin and of the devil; yet even in early Christian times it retained its character as the symbol of kingly power, for we find that pattern Christian knight, King Arthur, dreaming of himself as a great dragon, and assuming as his standard, after his father Uther Pendragon, the dragon of the great Pendragonship.

"And to his crown the golden dragon clung,
And down his robe the dragon writhed in gold,
And from the carven-work behind him, crept
Two dragons gilded, sloping down to make
Arms for his chair, while all the rest of them,
Thro' knots and ropes and folds innumerable,
Fled ever thro' the wood-work, till they found
The new design wherein they lost themselves."

And thus, in armour covered with twining dragons,

stands Arthur as one of the Christian worthies surrounding the tomb of the Emperor Maximilian at Innsbruck. In almost all ancient nations the dragon seems to have been borne as a standard, as it is at present in China, and the bearers were called Dracones. The Romans borrowed the custom from the Parthians or Assyrians, and their dracones were figures of dragons painted red on the flags; but among the Persians and Parthians they were like the Roman eagles, figures in full relief, so that the Romans often mistook them for real dragons.¹

"Among serpents," says Owen, the historian of the serpent, "authors place dragons, creatures terrible and fierce in aspect and nature. They are divided into Apodes and Pedates; some with feet and some without; some are privileged with wings, and others are destitute of wings and feet."

According to Herodotus some serpents are born with necklaces of emeralds, and in many old books of Natural History we find snakes figured with crowns on their heads, being told that they are to be met with thus adorned by nature, in the deserts of Africa. It was doubtless one of these crowned serpents which disputed the march of his brother Alexander the Great into his dominions, and kept his whole army at bay for a considerable time.² I say his *brother*, for it is reported that both that great conqueror and Scipio Africanus claimed to be descended from serpents, sharing that enviable parentage with large tribes of high antiquity in India, Africa, and America, now almost extinct.

Of all the strange pages of the world's history, that which relates to this deadly reptile is the most romantic and contradictory. If we turn to the Bible, we find the following strange anomalies: the sinful tempter, set forth as the type of Him who was tempted, yet without sin; the most venomous of beasts presented as the image of the healer; the seducer of our first parents, proposed as an example of wisdom to Christians.

¹ *Encyclopaedia Britannica*, 8th Edition.

² See Owen's *History of Serpents*.

That these apparent contradictions should have given rise to innumerable controversies is not surprising, but into these I do not wish to enter. We are all, I presume, now ready to agree with Josephus when he says, that "Moses in speaking of events which occurred after the seventh day, did so philosophically;" wherefore, we may assume his serpent to be a philosophical serpent, rather than that monster represented by later Rabbinical writers, who, according to Owen, affirm, that "Satan when he wished to tempt Eve, came riding upon a serpent of the bigness of a camel," and, doubtless, all glittering with gold and gems, or as described by Milton—

" Not with indented wave,
Prone on the ground, as since, but on his rear
Circular base of rising folds, that tower'd
Fold above fold a surging maze, his head
Crested aloft, and carbuncle his eyes ;
With burnish'd neck of verdant gold erect
Amidst his circling spires, that on the grass
Floated redundant ; pleasing was his shape,
And lovely—"

The *Universal History* tells us that—

"The serpent whose body the devil possessed was not of the common kind, but something like that fiery sort which we are told are bred in Arabia and Egypt. They are of a shining yellowish colour like brass, and by the motion of their wings and vibration of their tails, reverberating the sunbeams, make a glorious appearance ; these serpents are called in Scripture seraphs or seraphim, and gave name to those bright angelical beings which we commonly understand by that appellation, and it is probable that the angels when they ministered to Adam and Eve were wont to put on certain splendid forms, some of them the form of cherubim or beautiful flying oxen, and others the shape of seraphim, winged and shining serpents."

Certain it is that Moses in making the serpent the revealer of hidden knowledge, adopted a symbol easy to be understood by the Israelites after their long sojourn in Egypt, where the serpent was adored long before the

birth of Moses, as the emblem of Kneph, Cnubis, or Noum, the ram-headed divinity, supposed to be the prototype of Osiris, and of the Jupiter Ammon of the Greeks, the source of all knowledge and civilization; where also they might have become acquainted with that other serpent, the giant Apophis, slain by Horus, the emblem of evil and the evident origin of the Python of Apollo, of the serpent strangled by Hercules in his cradle, and of that slain by Krisna in India.¹

Owen says—"The Egyptians divided serpents into good and evil, the emblems of good and the messengers of wrath," and this double character may be traced in almost all countries, but more especially wherever the influence of Egypt extended; yet, strange as it may seem, I think that we shall find that its evil character is of a later date, and that the original conception of this much-dreaded reptile was that of a shrine or emblem of all good and beneficent gods.

Dr. Tylor, in treating of this subject, says—

"It is scarcely proved that savage races, in all their mystic contemplations of the serpent, ever developed out of their own minds the idea, to us so familiar, of adopting it as a personification of evil."

And again he says—

"Serpents hold a prominent place in the religions of the world, as the incarnations, shrines, or symbols, of high deities. Such were the rattlesnakes, worshipped in the Natchez temple of the sun, and the snake belonging in name and figure to the Aztec deity Quetzalcoatl; the snake as worshipped still by the Slave Coast negro, not for itself, but for its indwelling deity; the snake kept and fed with milk in the temple of the old Slavonic god Potrimpos; the serpent symbol of the healing god Asklepios, who abode in, or manifested himself through, the huge tame snakes kept in his temples; and the Phœnician serpent, with its tail in its mouth, symbol of the world and of the Heaven god Taaut, in its original meaning probably a mythic world snake, like the Scan-

¹ In these serpent-slayers I would see the conquerors of aboriginal tribes and founders of new dynasties.

dinavian Midgard worm, but in the changed fancy of later times adapted into an emblem of eternity.”¹

Now in all these instances, the serpent is the symbol of gods, chiefly worshipped as benefactors of mankind, and to them may be added the Chaldaean god Héa or Hoa, the source of all knowledge, who is figured on the black stones of Babylon as a great serpent. Turning to India, we find Vishnu the Preserver, sleeping during the long periods between his Avatars upon a couch of serpents, whose heads form a protecting canopy over him, and one of his Avatars or incarnations for the preservation of the world was in the form of a serpent. There, too, we see the egg of Brahma encircled by Agathodæmon, the good deity in the form of a serpent. Maurice in his *History of Hindostan* says—

“In Indian mythology the king of assoors or demons is called Naga, or king of serpents; in its primary sense the word signifies *diviner*, and therefore a certain class of serpents, for they were always divided into two distinct classes, have been immemorially considered throughout all Asia as sacred animals, and as having something prophetic in their nature. Their bodies have been ever selected as the usual and favoured abode of the deity, and all the statues of Indian deities in the Elephanta cave are enveloped with serpents to mark their divinity.”² *or divinity*

In Persia both Ormuzd and Ahriman, the good and the evil principle, were alike represented as serpents. In Greek and Roman mythology the place occupied by the serpent is well known; it was the emblem of Esculapius, the god of healing,³ who was the son of Apollo, yet Apollo was the slayer of the great Python, so that here also we find the dualistic character of the reptile carried out; Athena or Minerva bears the serpent in both characters—it adorns her person as an

¹ Tylor's *Primitive Culture*.

² Maurice's *History of Hindostan*.

³ It may be observed that physicians until quite recently placed the serpent symbol of Esculapius at the beginning of their prescriptions.

emblem of divinity, and is employed on her shield as a part of the Gorgon's head, to be a terror to her enemies; but probably in Etruria, Greece, and Rome, the serpent was looked upon rather as a minister of fate than as a divinity, although we read of the great serpent which defended the citadel of Athens, and was feasted with honey cakes monthly, and of the great serpent which was sent for from Epidaurus to Rome in consequence of the plague, and which left the vessel and took up its abode in the island of the Tiber, where a temple was erected to Esculapius in honour of the indwelling god.

The character of the Scandinavian serpent seems from some unexplained cause¹ to be almost wholly evil; in Nifelheim (hell) he gnaws the roots of the tree of life, and encircles the whole earth, which he will eventually crush in his folds. This evil character of the Scandinavian serpent, when compared with that of India and Egypt, is the more remarkable when we remember that Norway is a land almost, if not quite, free from venomous snakes, whilst the serpents venerated in other countries, instead of being of the innocuous kind, are generally the most deadly of their species; thus it is the cobra which is the emblem of divinity in India, the deadly asp or cobra in Egypt, the rattle-snake in America; and this appears still more strange when we contemplate these deadly reptiles as emblems of the god of healing.

The connection of the serpent with precious stones appears to be divisible into two parts—

- I. His relation to gold and gems.
- II. His relation to sculptured and sacred stones or mounds.

I. We all remember tales and legends which charmed us in our childhood of great venomous dragons guarding vast treasures of gold and jewels, and holding in

¹ The cause may probably be found in that race enmity, of which I shall treat more fully later, as existing between Turanian serpent worshippers and Aryans employing the eagle as their totem.

durance vile some virtuous princess till slain by some valiant knight, who releases and marries the princess, and possesses himself of the treasure. The mediæval representative of this class of legend is the famous *Niebelungen Lied* of Germany, in which Siegfried, the hero, after slaying a great guardian dragon and bathing in its blood, which makes him invulnerable, and possessing also a garment which renders him invisible, seizes a vast treasure which had belonged to a race of dwarfs (the Niebelungen), whom he had slain, and by virtue of his wealth and strength and invisibility thus acquired, marries Kriemhilda, sister of Gunther, King of Burgundy, which marriage leads to all the evil and bloodshed recorded in that fearful tale of treachery, revenge, and death. The origin of all the mediæval tales of dragon-guarded treasures, is doubtless to be traced to the fable of the dragon-guarded golden apples of the Hesperides, of which Hercules possessed himself by the slaughter of the dragon; but the serpent as the guardian of hidden treasure was revered in far earlier times, and in far distant countries, and it was only when Christianity became established, and taught that the serpent was the emblem of evil, that the good qualities which formerly had been assigned to the serpent as well as to the gem, were transferred from the guardian to the thing guarded, and precious stones were looked upon in Christian countries as sentient beings full of knowledge and power, able and willing to guard their wearer from all evil, whilst the dragon became a venomous beast, full of all malignity and wickedness.

Both these ideas seem traceable in early Hebrew traditions, but that of the virtues of gems may also be found in India, as in the story of the Syamantaka gem, given by Mrs. Speirs—

"A king named Satrajet enjoyed the privilege of a personal acquaintance with the sun, who appeared to him as a dwarf, with a body like burnished copper, and reddish eyes. He gave him the gem which he wore round his neck, which yielded eight pounds of gold a day, and averted fearful portents, wild beasts, fire,

robbers, and famine, but was death to a wearer who was not virtuous.¹

How early in the history of mankind gems began to be worn and appreciated, it is impossible to say. They are found in the most ancient of tombs and barrows. Their use probably preceded, or was coeval with, that of the precious metals. The love of ornament is inherent in mankind, and we find the most barbarous nations as anxious for personal adornment as their more civilized brethren, therefore doubtless the glittering stones found in caves and rivers were ever eagerly sought for, and the persevering industry with which they were bored and polished is truly surprising. Dr. Tylor tells us that this was managed by means of sand and water and a leaf stalk twirled by the hand, and that a whole lifetime might have been consumed in thus slowly boring a single gem, in confirmation of which gems half bored have been found in many barrows buried with those who wrought them as their most precious earthly possession, and adds—

"Humboldt was so struck with the cylinders of very hard stone perforated and sculptured into the forms of animals and fruits in South America, that he argued therefrom that they were relics of an ancient civilization from which their possessors had fallen, quoting especially the pierced and sculptured emeralds found in the Cordilleras of New Granada and Quito. At present the inhabitants of these districts have so little idea of the possibility of cutting hard stones, emerald, jade, felspar, and rock crystal, that they have imagined the green stone to be naturally soft when taken out of the ground, and to harden after it has been fashioned by man."²

The ancients attributed many virtues to gems; they were considered meet offerings to the gods; they all represented certain spiritual and moral virtues, and gave certain powers to their wearers, and were endowed with various mystic and even intelligent qualities. They all gave notice of the presence of poison, some

¹ *Life in Ancient India* (Speir).

² *Tylor's Early History of Mankind*.

turning dark and turbid, others pale and sickly, and some shattering themselves to pieces in passionate despair and abhorrence at its touch. The diamond symbolized innocence, justice, faith, strength, and the impassivity of fate. An old black-letter book says that "God hath indued hym with greater vertues than many other stones, albeit all are indued with many." Next to the diamond comes the holy sapphire, which renders the bearer pacific, amiable, and pious, and confirms the soul in good works, and by the mere force of its own pure rays kills all noxious and venomous creatures. To look at one preserved the eyesight, and the powder of sapphire was a sovereign remedy against the plague. It is a Jewish myth that the first tables of the law given to Moses were of this stone, whilst the table of wisdom engraved by Hermes, and laid up in the Egyptian temple, was of emerald.

It is worthy of remark that among the most ancient nations, and the semi-civilized barbarians of our own day, *green* stones seem to have been more highly prized than those of any other colour, and we read of wars among Polynesian tribes for the possession of certain green stones, used for making spear- and arrow-heads. The superstitious reverence felt by the Peruvians for emeralds is well known, and the tales told by Pliny and other old naturalists of the dragons, griffins, and wicked spirits who guard the emerald mines are numerous. Mr. Stevenson could not visit the emerald mine of Peru, owing to the superstitious dread of the natives, who assured him that it was enchanted, and guarded by a dragon, who poured forth thunder and lightning on those who dared to ascend the river that led to the mine. Marco Polo tells us that "the Khan of Tartary, having heard that the tomb of Adam was in Seilan (Ceylon), sent an embassy there, who procured two of the grinding teeth, which were very large, also the hair, and the cup of beautiful *green* porphyry which possessed such virtue, that when food was introduced for one man, it would be found enough for five." The qualities ascribed to the emerald in mediæval times were those

of restoring sight and memory, of sending evil spirits howling into space, of giving its wearer the power of finding out secrets, and rendering him invisible, and of changing colour from green to yellow, if the lover was faithless; and if unable to do its possessor good, or to avert evil, it shivered itself into a thousand pieces—broken by despair.

But of all the gems the ruby (called by the Greeks anthrax or live coal) gathers to itself, under the name of carbuncle, the most wonderful legends. It was a carbuncle which was hung in the ark to give light by night, and what but the ruby gave that magnificent stream of living glory from the bowl of jewels which Abraham set in the midst of his iron city to give light to his imprisoned wives? For Abraham was a jealous polygamist according to the Talmud, and must needs shut up his numerous wives in an iron city, where the very sunshine might not reach them, yet to give them light he set a bowl of jewels in their midst, which filled the air with lustre.¹

In all Eastern romances the ruby is to be found, lighting up enchanted halls, and filling dragon-guarded caves with floods of radiance; and the ruby is really in a degree phosphoric, occasionally giving out radiance under certain circumstances; like other gems it gave notice of poison; it also grew dark and cloudy if any evil was about to befall its wearer; but it banished sadness and many forms of sin and vice. The topaz was supposed to share with the ruby the property of giving light; worn round the neck it was a charm against sorcery, and had the power of banishing melancholy and sharpening the wit. The amethyst has the most profound antipathy to drunkenness, and so was used to stud drinking-cups, that men might drink to excess without intoxication. The opal was supposed to confer invisibility upon its wearer, but is also looked upon as the stone of misfortune.

The turquoise, according to Boethius, is believed to strengthen the sight and spirits of the wearer;

¹ *Temple Bar*, Oct. 1861.

but its chief commendation is its protective influence against falls, which everybody is assured it takes upon itself, so that the wearer escapes all hurt. It also shows by its hue the constancy of its owner. Turquoises are found almost exclusively in Persia, yet it is remarked that at the time of the Spanish conquest of Mexico, images were found among the Aztecs, inlaid with turquoises, in a manner precisely similar to that practised by the Persians; but the mine from which these stones came has never been discovered. The origin of amber gave rise to many fables, and its electric properties early attracted attention;¹ worn round the throat, it was said to ward off erysipelas and sore throat, and jet was credited with the same virtues, and mixed with wine was a sovereign cure for toothache, and was also employed in divination.

From all this it will be seen that the healing powers and gift of knowledge attributed in more ancient times to the serpent, were transferred later to the stones, of which he remained the guardian, although, probably in consequence of the study of the Hebrew Scriptures, he had become the emblem of sin and of Satan. Nevertheless, we may remark that the transformation was not yet complete, as had the dragon been deemed wholly evil, he could not have been employed as guardian of those gems which were credited with the power of banishing and destroying everything evil.

The *Gesta Romanorum* gives us some curious stories of the serpent making use of the gems under his care as curative agents and tokens of gratitude—

“Theodosius, the blind emperor, ordained that the cause of every injured person should be heard on ringing a bell placed in a public part of his palace. A serpent had a nest near the spot where the bell-rope fell. In the absence of the serpent a toad took possession of her nest. The serpent twisting herself round the rope, rang the bell for justice; and by the emperor’s

¹ The Egyptians gave the name of amber stones to all stones connected with sun-worship, and the same idea appears in Electron, the Greek name for amber.

special command the toad was killed. A few days afterwards, as the emperor was reposing on his couch, the serpent entered the chamber, bearing a precious stone in her mouth. The serpent creeping up to the emperor's face, laid the precious stone on his eyes, and glided out of the apartment, and immediately the emperor was restored to sight."

The bell of justice denotes the Eastern character of this tale, for it occurs in the real history of a Chinese monarch, as related by Huc—

"A king had an oppressive seneschal, who, passing through a forest, fell into a deep pit, in which were a lion, an ape, and a serpent. A poor man, who gathered sticks in the forest, hearing his cries, drew him up, together with the lion, the ape, and the serpent. The seneschal returns home, promising to reward the poor man with great riches. Soon afterwards the poor man went to the palace to claim the promised reward, but was ordered to be cruelly beaten by the seneschal. In the meantime the lion drove ten asses laden with gold to the poor man's cottage; the serpent brought him a precious stone of three colours; and the ape, when he came to the forest on his daily business, laid him heaps of wood. The poor man, in consequence of the virtues of the serpent's precious stone, which he sold, arrived at the dignity of knighthood, and acquired ample possessions. But afterwards he found the precious stone in his chest, which he presented to the king. The king, having heard the whole story, ordered the seneschal to be put to death for his ingratitude, and preferred the poor man to his office."

This precious stone of three colours seems an evident allusion to the serpent-stone of the Druids, which was of three colours, or to the stone called Solinus, sacred to Mithra, the sun-god of Persia.

"A knight who had dissipated all his substance in frequenting tournaments, in the reign of Fulgentius, is reduced to extreme poverty. A serpent haunted a chamber of his house, and being fed with milk by the knight, in return made his benefactor rich. The knight

had the ingratitude and imprudence to kill the serpent, who was supposed to guard a treasure in his chamber, and by this act was again reduced to poverty.”¹

A writer in *Fraser's Magazine*² gives a Lithuanian story of a child who stole away the crown of the king serpent, whilst he took his bath on a certain holy night, but was pursued by an army of snakes, and in her fright let fall the crown, with which the snakes returned, but one gem adhered to the child's apron, which enabled her to build a palace of solid gold. Also of the Knight Bran in the Isle of Wight, who picked up a dark stone, which was really the serpent's egg. He too was hotly pursued, but held on to the stone, which brought him untold treasures. *just as well*

One of the most curious of the properties ascribed by the ancients to gems, was that they were sexual, producing offspring, the males being described by Pliny as more acrid and vigorous, the females more languishing; and it is singular to find in the present day miners carrying out the same idea with regard to the gold-bearing reefs of America, for in a mining circular we are told that the miners say they never find gold under the large hillocks, which they call male, or buck reefs, but only under the smaller, female, or doe reefs. *tell me about it*

The serpent as well as the toad, which in old books is classed as a serpent, was supposed to have “a precious jewel in its head;” and here I must call the attention of my readers to those curious stones known as serpent-stones, which are credited with the power of healing the bite of venomous serpents. The *Encyclopædia Britannica* (8th edition), under the head “Bezoar,” gives the following description of this stone for preventing the fatal effects of poison—

“The first mention made of it is in Avenzoar, an Arabian physician. He describes it as generated of the tears of stags; who, after eating serpents, used to run into the water up to the nose, where they stood till their

¹ “Gesta Romanorum” in Warton's *History of Poetry*, cap. CV., CIX., CXII.

² *Fraser's Magazine*, November 1872, “Demonology.”

eyes began to ooze a humour, which, collecting under the eyelids, gradually thickened and coagulated, till, being grown hard, it was thrown off by the animal in rubbing frequently. The bezoar is a calculous concretion found in the stomach of certain animals of the goat kind. It is composed of concentrical coats, surrounding one another, with a little cavity in the middle, containing a bit of wood, straw, hair, or the like substances. There are two sorts, one brought from Persia and the East Indies, the other from the Spanish West Indies. The Oriental is of a shining dark green, or olive colour. The Occidental has a rough surface, and is less green in colour, but larger, being sometimes as large as a goose egg, whilst the Oriental seldom exceeds the size of a walnut, but is considered the most valuable."

The deer described above as feeding upon serpents is evidently the musk deer, which I find from Du Halde's *China* is credited with the same fondness for a serpentine diet, and the musk is considered so perfect an antidote to the bite of serpents, that peasants going into the districts where these reptiles abound, always carry about them a small portion, or place it between their toes, thus feeling quite secure from molestation. There can, I think, be no doubt that serpents, like other animals, have certain feelings of attraction and repulsion for strong scents, which are probably known to and made use of by snake-charmers. In all countries the ash tree has been deemed so inimical to snakes that they are supposed to be unable to pass through a circle made on the ground with this wood, and this superstition prevails in Scandinavia, England, and America, but I have not traced it to Africa and the East.

It is evidently a bezoar which is described by Lord Lytton in his *Strange Story*, as used in Corfu as an antidote to the bite of serpents.

"This stone is of an oval shape, of so dark a colour as not to be distinguished from black, and having been broken formerly, is now set in gold. When a person is bitten, the bite must be opened by a lancet and the stone applied within twenty-four hours. The stone attaches

itself firmly to the wound, and when it falls off the cure is complete. It must then be thrown into milk, whereupon it vomits the poison it has absorbed, which remains green on the top of the milk, and the stone is then again fit for use. The peasants, when bitten, immediately apply for its aid, and it never failed but once, and that was when applied after twenty-four hours."

Sir E. Tennant, in his *Ceylon*, gives an account of similar snake stones, except that they are intensely black and highly polished, which are used to cure the wounds of the cobra. A similar property is ascribed in Ireland and North Britain to the ancient stone spindle whorls called Pixies' wheels or Fairies' mill-stones, and also snake and adder stones.

II. The relation of the serpent to sculptured, engraved and sacred stones carries us back farther into the world's history, and reveals to us the reptile as still the object of veneration, if not of adoration, among widely remote nations. If we search among the tombs of Egypt, Assyria, and Etruria, we shall find innumerable signets, cylinders, and scarabei of gems, engraved with serpents: these were probably worn as amulets, or used as insignia of authority; and in the temples and tombs of these and other countries, serpents are engraved, or sculptured, or painted, either as hieroglyphics, or as forming symbolical ornaments of deities or genii. In India, as before mentioned, they are sculptured twining round all the gods of the cave temples. In Norway and Scotland they are engraved on the stones which, according to Fergusson, mark the graves of kings and heroes, and the oldest of the Scandinavian runes are written within the folds of serpents engraved on stones. In those mysterious erections of unknown use and date called the Torre dei Giganti in Malta, the only representation of animal life is a sculptured serpent on a stone near the entrance of an inner chamber.¹ In Peru, the unfortunate Inca appointed to meet Pizarro in one of the large stone buildings in Caxamalca, called the House of the Serpent, from a serpent sculptured on its walls, and

¹ Fergusson's *Rude Stone Monuments*.

which he probably vainly imagined would on that account prove a sacred and inviolable refuge.

The sculptured snakes of Greece and Rome are numerous; they may be seen twining round the rod of Mercury; forming the necklace of Minerva, and hissing round the Gorgon's head on her shield; representing the hair of the Furies, and incorporated with the three-headed monster Cerberus; wreathing in their deadly folds Laocōōn and his sons; or writhing and quivering beneath the arrows of Apollo, or the club of Hercules. In all these various forms some one of the attributes of the serpent was symbolized. He is the messenger of fate to Laocōōn; the symbol of vengeful power in the Furies and Gorgons; the emblem of evil in the Hydra and Python; of knowledge and power in Minerva and Mercury; the guardian of Hades in Cerberus.

In the sculptured stones of the North it would seem to have simply the character of a sacred guardian.

Owen says—"It is remarkable that where the figure of two serpents was erected in a place, that place was looked upon as consecrated"; and again, "In Calicut the dragon was made guardian of houses and temples, and all their treasures." Thus, probably, the dragons sculptured on tombs were so placed as a sacred seal to prevent the sacrilegious spoliation of the dead, who were frequently buried in costly ornaments. Of this character was no doubt the dragon on the tomb of King Gorm in Jutland, to which Fergusson assigns the date of A.D. 950, wherein was found a silver goblet lined with gold, and ornamented with interlaced dragons, and also tortoise-shaped fibulæ, with fantastic heads of animals; and the one in Scania, beneath which treasure was found by the Northmen in 1152, and many others of the same kind might be mentioned.

Owen, descanting upon serpent worship, says quaintly—"Some make Cain the founder of serpent worship, but the general opinion is that it did not commence till after the deluge, because the world was drowned for atheism, and Noah's successors thought it better to have many gods than none. Some Rabbins," he says,

"call the serpent that deceived Eve the angel of the dead ; others look upon him as the prince of angels, and believe he is to preside at the last judgment, and make offerings to him on the day of solemn expiation, to appease his indignation. Taautus attributed some deity to the nature of a serpent, an opinion approved by the Phoenicians, who represented the world as a circle, in the midst of which was a serpent representing the Good Demon or Genius of the World, and a symbol of the Almighty Creator."¹

In treating of the *sacred* stones connected with serpents, we will leave out of the list those great circles, such as Stonehenge and Avebury, which were imagined by Stukeley and others to have been erected by serpent-worshippers in the form of their god, and respecting one of which circles, that of Stanton Drew, there is related a post-Christian legend in *Rude Stone Monuments*, which would certainly tell in favour of the old belief. The legend relates that—

"Keyna, a holy virgin in the fifth century, daughter of a Welsh king, obtaining a grant of the land on which Keynsham now stands, was warned of the insecurity of the gift, in consequence of the deadly serpents which infested the place ; she however converted the serpents into the stones which form the circle at Stanton Drew."²

A similar legend is related of St. Hilda, but the serpents she converted into stone, after depriving them of their heads, were ammonites.

But leaving all these traditional serpent-stones, and temples for serpent-worship, as still of doubtful origin and design, there remain others both in our own country and in America, and probably in many other countries, of undoubtedly serpentine form. One of these, discovered in Scotland by Dr. Phené, F.R.G.S., near Loch Nell, in Argyleshire, is described in *Good Words* for March 1872. Many cairns opened in the neighbourhood were found to contain various stones both round and conical, evidently used as symbols of divinity, the

¹ Owen's *History of Serpents* (1742).

² *Rude Stone Monuments*, Fergusson.

round or oval probably representing the earth, or earth-goddess, and the conical the sun or fire. The use of the pine-cone in worship is abundantly shown in Assyrian sculptures, and according to Hooker, it is still used by aboriginal Indian tribes as an offering to their gods.

On many old coins and medals the rays of the sun are represented by separate conical projections, resembling these stones in form, and therefore it appears probable that the conical sacred stones, in these serpent mounds, would denote that their builders were also sun-worshippers. The conical black stones found at Babylon,¹ upon which are depicted the constellations, the serpent being the most prominent, were evidently connected with the worship of the sun-god, as his emblem, and that of his wife, with that of the moon, surmount the whole. It is singular that in the East black stones seem the most sacred; but of the black stone in the Kaaba at Mecca, tradition says it was originally white.

The serpent-shaped mound at Loch Nell is small compared with a similar one in Ohio, which is 700 feet long; but that which most plainly connects the two is the fact that a large oval mound is found near the mouth of each, evidently representing the mystical egg, which appears so frequently in the mythologies of all countries.

There appears to me an extraordinary resemblance, which cannot be accidental, between the serpent-mounds with the oval mound near the head of each, and the rude scratchings hardly to be called engravings, found on some of the oldest stones in cairns and dolmens, one of which from Dowth, in Ireland, is figured in *Rude Stone Monuments*; and of all, to the great constellation Serpentarius, in which the serpent appears to be gaping to swallow, or rather to eject from his mouth, that oval cluster of stars called the Northern Crown, the whole group, as figured in the constellation, bearing an evident analogy to the Indian and Egyptian myths, relating to the *mundane* egg, or egg of Brahma,

¹ See Rawlinson's *Ancient Monarchies*.

which, as I have before noticed, is represented as encircled by Agathodæmon in the form of a serpent; the same idea being carried out in the winged and serpent-enfolded globes of the Egyptian temples, in Mexican sculptures, and in the serpent's egg adored by the Druids. This famous egg and its origin is thus described in the *Encyclopædia Britannica*¹—

"This extraordinary egg was formed, as they pretended, by a great number of serpents, interwoven and twisted together, and when it was formed it was raised up in the air by the hissing of these serpents, and was to be caught in a clean white cloth before it fell to the ground. The person who caught it was obliged to mount a swift horse, and to ride away at full speed to escape from the serpents, who pursued him with great rage until they were stopped by some river. The way of making trial of the genuineness of the egg was no less extraordinary. It was to be engraved in gold, and thrown into a river, and if it was genuine it would swim against the stream.

"I have seen" (says Pliny) "that egg; it is about the bigness of a moderate apple; its shell is a cartilaginous incrustation, full of little cavities, such as are on the legs of the polypus; it is the insignia or badge of distinction of the Druids." The virtues which they ascribed to this egg were many and wonderful. It was particularly efficacious to render those who carried it about with them superior to their adversaries in all disputes, and to procure them the favour and friendship of great men."

This *anguinum ovum* is supposed to have been the curious glass bead of three colours, still sometimes found in barrows, but they do not seem to agree with the description of Pliny, and although the whole account as given by that celebrated naturalist has been regarded as fabulous, it must be observed that Dr. Livingstone tells us, that he has found in Africa a number of serpent-skins knotted and twined together in the

¹ *Encyclopædia Britannica*, 8th edition: Article, "Anguinum Ovum."

manner above described. It seems no uncommon thing for snakes to roll themselves together in a ball during cold weather. Many of these balls of living hissing snakes, some of great size, have been described by travellers, but the egg is of course mythical.

This connection between the serpent and the egg represents some very ancient religious mystery of Eastern origin. The article upon the *anguinum ovum* in the *Encyclopaedia Britannica*, before quoted, goes on to say—

"Some have imagined that this story of the *anguinum* was an emblematical representation of the doctrine of the Druids concerning the creation of the world. The serpents, say they, represent the Divine wisdom forming the universe, and the egg is the emblem of the world formed by that wisdom."

Maurice says—"On the ancient sculptures and medals, the egg and the serpent, single or combined, occur in great variety: the mundane egg, encircled with Agathodæmon, the good serpent, suspended in the temple of Hercules at Tyre, is well known."¹

And he adds—"The idea of the mundane egg is supposed to have been derived from Taut or Hermes, prime minister of Osiris, the imaginary invader of India. His maxim was that the world was *oviform*, and hence the oval figure of many of the oldest Egyptian temples."

It is certain that those gods of whom the serpent was particularly emblematical, were generally regarded as the Creator, forming the world from an egg; and are usually represented with this egg proceeding from their mouth. For this egg I believe the pine-cone was substituted at a later date, as being conic *oviform*, containing within it the germs of life, and the united forms of the stones emblematic of the sun and earth, and thus the serpent mounds, each with its oval mound or egg close to the head, representing so minutely the ancient Eastern traditions, and the Druidical legends, as handed down to us, become most interesting

¹ *History of Hindostan.*

ethnological studies; and that the same combination should occur in the sculptures of Mexico is very remarkable.

It seems certain that the Druids employed some sort of stone, under the name of serpent's egg, both as a charm and an emblem of some divinity, probably of that obscure deity called Esus or Hesus, supposed to represent the Earth; and in the medicinal properties ascribed to this curious stone, we may see the first traces of those wonderful properties ascribed to precious stones as already related; and also one of the earliest historical notices of the reverence paid to stones in Britain, a reverence which seems to prevail among almost all semi-civilized races, and a survival of which may be traced in our veneration for the coronation-stone at Westminster, which, singularly enough, appears to have come originally from the neighbourhood of the great serpent mound at Loch Nell, and may, perhaps, have some connection with it.

Numerous instances in which stones of a peculiar shape have been found in ancient barrows are given in Dr. John Evans' *Ancient Stone Implements of Great Britain*, and these are almost always either ovoid or conical, and among them may be specially noted one found in a barrow near Stonehenge, described as a sardonyx, striated with belts of colour, and spotted all over with very small white spots. Two at Caer Leb, Anglesea, supposed to be amulets, had also a band of little pits round them, which would seem to connect them with Pliny's *anguinum ovum*. Two egg-shaped objects, apparently of Carrara marble, were found in Luneburg tunnel; and in the churchyard at Penneyneidd, Anglesea, numerous skeletons were found with a white oval pebble near each. The learned author says—"It is doubtful whether these bones were those of Christians or not," but adds—"In interments of earlier date, such instances seem to point to some superstitious custom, probably like that in India, where the mystic Salagramma pebble held in the hands of the dying Hindoo is a sure preservative against the pains

of eternal punishment." This pebble it must be remarked was *black*.

But the most remarkable proof of the connection between the serpent and pebbles of a conical form as emblems of the sun, may be seen in vol. ii. of the *Archæologia*, where a deity is figured evidently representing the sun, the upper half that of a woman, her head surrounded with the conical projections already noticed, and holding in her hand a conical pebble, the lower part of the body terminating in a serpent's tail.¹ This remarkable figure was found in a tumulus in Tartary, but similar figures may be seen among Indian and Etruscan sculptures and paintings.

It is generally conceded that this great serpent myth was of Turanian, that is Mongoloid, and pre-Aryan origin, and it is worthy of notice that the only civilized countries preserving the old veneration for the serpent or dragon are China and Japan, both Mongoloid empires. There too the royal ceremonial boats are still made in the form of serpents, as formerly those of Scandinavia and probably of Egypt were also. In China a dragon is still appointed as guardian of every province, and if he refuses to listen to the prayers of the people to grant them rain or fine weather as desired, he is banished for a time.

Perhaps the nearest modern approach to the serpent's egg of the Druids is to be found in Dahome, where Dank, the Heavenly Snake, is said to make the Popo beads, and to confer wealth on man; and there, as also among the Zulus, the snake is identified with the rainbow, which may also be figured in the Scandinavian Eirek's Saga, where "Eirek, journeying towards Paradise, came to a stone bridge guarded by a dragon, and entering into its maw found he had arrived at the world of bliss."

The inferences to be drawn from all these instances in which we find stones of various kinds associated with the serpent, or with a race of serpent-worshippers, appears to me to be that the whole egg-and-serpent

¹ Among Turanian races the sun is usually a female divinity.

myth originated in the far East, probably in India or Scythia ; that it was of Turanian origin, and became disseminated over the whole world by colonists of that race, and although it was repudiated by the succeeding Aryan races, who brought with them their own mythology, and probably rejected with scorn the traditions of the conquered, turning the beneficent Agathodæmon into the terrible dragon, the emblem of sin and of all evil, yet the older traditions lingered among the aborigines, who became probably largely mixed up with the conquerors, and hence we find among the folk-lore of almost all nations, traditions in which the serpent or dragon becomes a powerful agent for good as well as for evil, a healer, a treasure guardian and wealth-giver. It also seems probable that these early serpent races were in all cases the pioneers of civilization; all the traditions clustering round them point them out as agriculturists and metal workers; their monuments would seem to show that they were astronomers and architects of the cyclopean type; but they appear also to have mixed up with their superstitions the bloody rites of human sacrifices, although probably in the beginning their creed was pure sun-worship, and the serpent was simply a totem, the tribal emblem of some great ancestor or benefactor, to whom they had been indebted for much of their knowledge and the power it gave them over the rude tribes to whom they carried the arts of civilization, and by whom they became venerated as great good serpents. The serpent was thus looked upon as the very emblem of the Creator, or great ancestor, and from this became developed that worship of ancestors which is so peculiar to Turanian races.

CHAPTER X.

DIVINATION—BY THE ROD AND BY THE ARROW.¹

Witch-doctors and Diviners—Modern *Dowser*—History of the Divining-rod—Its Shape—To be cut from a Fruit-bearing Tree—Connection with the Sceptre and with Horns as Symbols of Power—The Bifurcated Stick with Rings borne by many Gods—Augury by Birds—Survival in the Wishing-bone—Miracles wrought by the Rod—Extreme Development of Rhabdomancy among the Finns—Miraculous Virtues ascribed to Trees—Divination by Arrows—Used in casting Lots—Belomancy practised by Nebuchadnezzar and by the Ancient Greeks—Lots among the Anglo-Saxons, Hottentots and Kaffirs—Connection of Rods and Arrows with Ancient Alphabets—Magical Virtues of Runes—The Etruscan Tages and Greek Python—The Irish Alphabet—Rhabdomancy and Belomancy traceable to pre-Aryan Race—Possibly possessed of a Power unknown to us—Subject for Psychological Research.

IN investigating the early history of the human race, we cannot fail to be struck with the great part played by those who are now denominated witch-doctors among savages, but who in earlier times and under various names have followed the arts of Divination, for in some form divination has been practised by every nation, civilized and uncivilized, with which we are acquainted. It doubtless had its origin in the world's infancy, when men began to see in natural objects things incomprehensible, and were led by dreams and visions to a belief in the supernatural, and by a further step in the same direction to associate the spirits of the departed with things animate and inanimate. Hence arose an elaborate system, divided into numerous branches, requiring

¹ Reproduced with additions from the *Journal of the Anthropological Institute*, April 1876.

as its exponents trained men skilled in the deep mysteries of nature, and admitted to a knowledge of those dexterous juggleries whereby natural phenomena were made to assume awful and threatening aspects in the eyes of the ignorant and superstitious multitude, in order the more securely to maintain that authority obtained by a reputation for supernatural power. Thus the magicians of Egypt, the astrologers of Chaldæa, the magi of Persia, the augurs of Etruria, Greece, and Rome, the Druids of Gaul and Britain, all diviners, exercised probably more real power than the kings and chiefs of their respective countries, who were commonly only the ministers of the will of the gods as interpreted by their priests.

To treat of divination as a whole would be manifestly impossible; the subject is so vast that it would require volumes. I therefore purpose to take two branches only of this wide subject, believing that in their extensive range and singular affinities they present matter of especial interest to anthropologists, whilst the survival of one of them in our own country at the present day is a curious instance of the durability of superstition notwithstanding the advance of education and civilization.

Among the Mendip Hills, in the old mining districts of Cornwall and Derbyshire, Rhabdomancy, or divination by the rod, still flourishes, and only last year a long correspondence took place in the *Spectator* and some other papers with regard to its use in various parts of England for the discovery of water, the operators being in almost all cases well-known *dowsers* from the West of England. One of these I have myself seen at work in the neighbourhood of Bath, and can testify that water was certainly found at the spot indicated by him, in consequence of the violent agitation of the hazel-rod he carried.

These diviners always assert that the *power of the rod* is confined to very few, not one in a thousand being able to make use of it; and I certainly never heard that those who ridicule the practice have themselves been able to control the motions of the rod, which in many cases becomes so violently agitated as to break in the

hands or the operator; but whether this is effected by sleight of hand, or whether there really exists some mysterious force in certain persons not possessed by mankind in general, I must leave to the judgment of psychologists.

Reports have from time to time been given of wonders performed by this mysterious power, and there can be no doubt of the belief of Cornish and Mendip miners in its genuineness. They have been called upon to exercise it not only in England, but in some of the Colonies, and have generally done so successfully; nevertheless there are doubtless many pretenders to the art, some of whom, as the notorious Jacques Aylmar (1692), have been proved to have been impostors; but for particulars of these, and of the well-known case of Lady Milbanke, who convinced Doctor Hutton of the reality of the power by discovering a spring in his own garden, I must refer the curious to the pages of *Notes and Queries*, the *Quarterly Review*, 1853, Migne's *Dictionary ("Sciences Occultes")*, and the works of Pierre Lebrun, Baring Gould, and others; my object being not so much to analyze the possibility of the alleged power, as to trace the origin of a widespread belief.

All writers who have treated of divination by the rod have assigned to it a very high antiquity. They generally trace its origin to the Scythians, and say that from them it passed into Assyria, Palestine, Greece, Etruria, Rome, and by another route through Russia and Germany to England. They identify the divining-rod with the miracle-working rod of Moses and Aaron, the Caduceus of Mercury, the wand of Circe and other magicians, and the lituus of Romulus and Numa Pompilius; and in all the wonders related of it may be traced some connection with one or other of these famous miracle-working wands, for the divining-rod was employed not only to discover water-springs and metals, but also to mark out boundaries, to discover corpses, and to bring to justice murderers and thieves. In the discovery of water its affinity was with the rod of Moses, who by striking the rock with the rod caused water to

gush forth ; but the remaining qualities assigned to it seem to have more especial reference to the Caduceus of Mercury, which was the golden rod of wealth, and was used to conduct souls to Hades ; whilst Mercury in his character as Hermes was especially the god of boundaries and of thieves, having himself been a thief, even from the day of his birth, when he rose from his cradle to steal the cattle of Apollo.

In the power assigned to the divining-rod of tracing boundaries we see its affinity not only with the rod of Mercury, and that of the older Egyptian Thoth or Hermes, who taught the Egyptians to measure their fields, but also with the *lituus* of Romulus, used by him to mark out the various regions of Rome, and which was afterwards laid up in the temple of Mars as a most precious relic. Plutarch says that Romulus was very religious and very clever in divination, and for this purpose made use of a *lituus*, which is a (bent) stick. This *lituus* was preserved as a sacred object, and no profane hands were allowed to touch it. This rod was found entire after the barbarians had pillaged and burnt the city, upon which Cicero remarks—"What a consolation for the Romans to recover this rod ; it was to them an earnest of the eternal duration of Rome!"¹ Livy tells us that it was by this *lituus* that Numa was elected to succeed Romulus, but he fails to tell us by what signs the choice was determined, although the ceremony is thus described—"Numa, wishing to consult the gods, as his predecessor had done, caused an augur to conduct him to a high citadel. There this augur, having in his right hand this bent stick, placed himself on the left of the prince. He observed the aspect of the town and of the country, prayed to the gods, and marking the east and the west, turned towards the east to have the south on his right hand, after which he took the *lituus* in his left hand, put his hand on the head of the prince, and made this prayer—' Father Jupiter, if Justice demands that Numa Pompilius, whose head I touch, should be king of the Romans, suffer us to have evident signs of it in the

¹ Lebrun.

division I am about to make.'"¹ The likeness of the divining-rod to the wand of Circe is to be found in its use by magicians in their fancied metamorphoses of themselves and others into various animals.

It may be supposed that with the numerous properties assigned to the divining-rod different forms and different substances would be employed in its manufacture; thus we find that although the most general form was that of the letter V, with the lower limb more or less elongated, the reason assigned for the form being that it is supposed that the hands convey some virtue to the rod, yet sometimes a straight stick was employed, or one cut straight in the centre, with a branch at each end (—), and sometimes the forked branch was cut close to the fork (V), whilst frequently several rods were used together. Hazel was the wood generally most esteemed, but the almond, the willow, the ash, or some fruit-bearing tree had each many advocates. Some argued that in searching for metals, rods of metal should be used, or that at least the wooden rod should be tipped with metal; and it was commonly believed that it would only turn for that particular object in the search for which it was employed; to ensure which result it should be first touched with that substance which it was expected to discover. In using them sometimes a prayer was said, or sometimes a cross was engraved on the rod. Lebrun² describes four old divining-rods found in Paris, on which were inscribed the names of the three magi, Baltazar, Gaspar, and Melchior. In the laws of the Frisians after their conversion to Christianity, permission was given to use divining-rods in proving homicide, and the ceremony was performed in church before the altar. Two twigs, one marked with the sign of the cross, were covered with clean wool and laid upon the altar, or the holy reliques, and a prayer made that God would by a sign discover the guilty.³

¹ Lebrun, tom. ii. p. 394.

² *Ibid.* tom. ii. bk. vii. p. 635.

³ *Archæologia*, vol. xliii.

In considering the origin of the supernatural qualities assigned to the divining-rod, we cannot fail to observe its obvious connection with the use of a rod or staff, either plain or variously ornamented, in all ages and in all countries, as a symbol of authority. The sceptre of modern monarchs has its prototypes in ancient Egypt, in Peru, and even among the relics of the unknown pre-historic cave-dwellers of France and Britain; for some archæologists believe that the stag's antlers perforated with one or more holes, and often engraved with various figures, which are sometimes found in the caves explored, are the sceptres or wands of office of those primitive people, although they are more probably identified with the arrow-straighteners still in use among the Eskimo. It seems to me not altogether improbable that the branching horns of the stag, used in former times as a token of the power possessed by the chief of a tribe, may have suggested the form of the divining-rod. Certain it is that horns of various kinds were used in the very earliest times to symbolize power, and hence were frequently chosen to adorn the heads of gods. The figure most suggestive of the use of the horn as a symbol of dignity in Gaul and Britain is that dug up in Paris, and engraved in the *Pictorial History of England*. It represents a robed man, the head adorned with horns, which may be either single-branched stag's horns or forked sticks, and beneath is the inscription Cernunnos; the peculiarity in this figure is that the horns have upon them several rings strung upon a larger one. Now we are told by Philostrates that "The Indian Brahmins carry a staff and a ring by means of which they are able to do almost anything."¹ The images of Vishnu commonly represent him as twirling a ring on the finger of one hand, whilst on the cylinders of Babylon the forked and branched wands borne by priests or monarchs are frequently adorned with rings. In all magical ceremonies the first step was to draw a circle with the magic wand. The Assyrian goddess Hera, figured by Layard, bears in one

¹ *History of Magic*, p. 220.

hand a rod surmounted by a circle, and in the other one with a crescent; and it is a curious coincidence that in the rock sculptures of Peru, as given in Hutchinson's work, a human figure appears bearing a rod, to the end of which a ring is attached, whilst another rod of the form of a bifurcated stick is represented on the same rock, having a bird perched upon it, thus evidently connecting it with augury.¹ "The bifurcated stick," says Tyndale in his book on Sardinia,² "must have been an important symbol; it appears in Etruscan tombs, and on Babylonian cylinders. In the coins of Cyprus the columns of the temple of Venus are represented with bifurcated capitals, and the Pythagorean Y, the symbol and emblem of human life, might perhaps also be considered an analogous character." To these may certainly be added the standards of the ancient Egyptians as given by Wilkinson (vol. i. p. 294), upon which the same form of the branched or bifurcated stick appears; indeed the rods borne by Egyptian gods or priests are almost always forked at the lower end, whilst they bear on the top either a lotus-flower or the head of some sacred animal, most commonly that of the sacred jackal; and it is worthy of remark that the same animal was also sacred in Mexico, where it has been found buried with care.³

If we turn to the representations of the divinities of Greece and Rome we find them all bearing rods typical of their several attributes, and amongst them the ring and staff and the bifurcated stick are conspicuous. That which I take to be an early form of the Caduceus given in Smith's *Dictionary* as from a painted vase, represents these two forms combined, whilst in that assigned to Pluto the origin from the head and horns

¹ Mr. Hutchinson describes a stone found in a ruined city of Peru, on which is represented "a man holding in his hand a kind of staff or sceptre formed of a group of serpents, and on his head an ornament on which is engraved a large number of snakes and other figures."—*Anthropology of Peru*. T. J. Hutchinson, *Journal of Anthropological Institute*, April 1875.

² Tyndale's *Sardinia*.

³ Tydar, *Anahuac*.

of an animal may readily be traced. Two singular survivals illustrating the use of a forked stick in divination and lots, and connecting it also with that which I believe to be the earlier form, that of the horn, and also with augury by birds may here be noted. The first is the use still made by young people of the merrythought or wishing-bone of a fowl, the form of which is that of the divining-rod, and also of the branching horns of the stag ; this pulled asunder denotes good luck to the one in whose hand the larger portion remains, and being again drawn as a lot gives a wish to the fortunate drawer of the lucky portion, the belief in the peculiar luckiness of this bone being evidently derived from the ancient use of the cock in divination. The second survival I would notice is the use of the first and fourth fingers of the hand extended so as to form a figure strongly resembling the rod of Pluto as a charm against the evil eye. I do not know whether this form, which is called "making horns," is still employed in England, but it is commonly used in Italy.

The form of the rods of Moses and Aaron are not defined, but from the budding of the latter it was probably a branched stick of almond. There is a passage in Hosea (iv. 12) : " My people ask counsel at their stocks, and their staff declareth unto them," which is given by Jerome, Cyril, and other commentators as well as the Septuagint as referring to Rhabdomancy among the Hebrews, who are said to have learnt the art in Babylon ; and it is suggested that perhaps at the same time they consulted both the rod and an idol, the figure of some god being engraved on the rod.

The use of divers rods in divination would soon cause them to be regarded as possessed of inherent power ; hence we find innumerable instances given of miracles wrought by the rod. It is evident that some veneration existed in the mind of Moses for the rod which became a serpent, and wherewith he smote the rock ; and that of Aaron which budded and produced almonds was laid up in the ark with superstitious reverence. When

Elisha was applied to for the restoration of the dead son of the Shunammite, he sent Gehazi to lay his staff upon the child's face as though in that resided life-giving power, and this belief in the miraculous and curative properties of the rod, extended to mediæval times.

In Lebrun's *Histoire des Pratiques Superstitieuses*, p. 367, we find, "Borel relates of the physician Laigneau, that he made use of no other remedy than a rod of hazel to cure broken bones. He cut little hazel-wands when the sun entered the sign of the Ram, and having sealed the two ends to keep in the virtue, he only rubbed the contusions with one of these rods, and the bones were restored to their places as if by enchantment. The same doctor also prepared rods of ash at the conjunction of the sun and moon in the sign Aries, and by a touch with them cured hæmorrhages."

Lenormant points out the extreme development of this superstition among the Finns thus—"Whatever might be the power of those enchantments which controlled nature and supernatural beings, spirits, and gods, there is a talisman still more powerful, for it arrests their effect and protects from it those who possess it; it is the 'celestial rod' (*baton celeste*) analogous to the divining-rod of the Magi of Media. The gods themselves can only be secured against certain enchantments by virtue of this rod."¹ Wainämöinea, menaced by the chief sorcerer of Lapland, replies to him—"The Lapp cannot injure me by his enchantments, for I have in my hand the celestial wand, and he who hates me, he who creates mischief does not possess it."

When the magician traced with his wand a circle on the ground, as was commonly done in all magical ceremonies, it was doubtless to signify the power he possessed by virtue of the rod over the god supplicated. Hence the circle which everywhere represented the sun became united with the rod to form a magical symbol; and the same was the case with the crescent signifying the moon, represented in its earlier form by the bifur-

¹ *Les Sciences Occultes en Asie*, Lenormant, p. 241.

cated stick. Thus when we find these figures carried out in stone circles, grave-mounds, and tumuli, as notably at Stonehenge, and among the Sepolture dei Giganti in Sardinia, we may reasonably assume them to have been erected by the worshippers of those gods whose symbols they represent.

In almost all civilized lands we have legends of trees to which miraculous virtues are ascribed. The oaks of Dodona and of the Druids, the ash of Scandinavia, America, and Britain, the fig-tree of India are examples of this; but there is something unexplained in the peculiar power ascribed to the hazel, from which preferably magicians' wands were made. This is supposed by some to arise from its faint resemblance to the almond, from which the rod of Aaron was taken; or, according to others, because it was the wood used by Moses to sweeten the waters of Marah. But that a peculiar sanctity was attached to the hazel and its fruit in lands where Moses and Aaron were quite unknown, and long prior to the introduction of any Jewish or Christian tradition, is evident from the frequent discovery of hazel-nuts in pre-historic graves, not only in this country, but even in Peru.¹

Lebrun gives the following prayer or incantation used at the cutting of divining-rods, which certainly savours strongly of worship—"Hazel, I break thee, I conjure thee by the virtue of the Most High God, to show me where may be found gold, silver, or precious stones; I conjure thee to show me that thou hast as much virtue as the rod of Moses, which he made into a serpent. I conjure thee to show me that thou hast as much power as that of Aaron, when he led the children of Israel across the Red Sea. Thus I break thee, hazel, at this time, in order that thou mayst discover to me that which is hidden, in the name of God," &c.

Although the almond furnished the rod of Aaron, that of Moses, called the rod of the prophets, was cut, we are told, by Adam from a myrtle of Paradise, and was given to Moses by Shoaib, the father of Zipporah,

¹ See Hutchinson's *Two Years in Peru*.

to whom it had descended, in order to drive away the wild beasts from his flocks,¹ and the singular tradition connecting this rod with the Christian Cross is worthy of notice, although the tradition, as given in the *Cursor Mundi*, differs somewhat from that of the Koran quoted above.

According to the *Cursor Mundi*, three trees—cedar, cypress, and pine—grew from seeds placed under Adam's tongue after death, and rods of these three trees grew miraculously three nights following, at the head of Moses in the wilderness; he therefore plucked up the rods and carried them with him, and by virtue of them converted the bitter waters into sweet, and finding them to be so potent, would never let the wands go out of his sight. Before his death Moses planted them again in a secret place, which was revealed to David in a dream; and the three wands having grown into one stem, yet still separate, the tree thus formed was carried by the king to Jerusalem, many miracles of healing having been performed by the “virtuous trees” upon the road. In Jerusalem they were planted, duly guarded, and greatly reverenced by Solomon, who sat beneath their shadow, which had a miraculous influence. The cedar-tree was felled to make a beam for the temple, but not having been used for that, was laid up in the temple, and from the silver girths with which David had bound it, were made the silver coins given to Judas Iscariot. The beam was then thrown into a pool, to which it communicated healing virtues, and after having served as a bridge in order that its virtues might be trodden out by the feet of sinful men, was chosen to form the wood of the cross in fulfilment of the prophecy of Solomon.²

Belomancy, or divination by arrows, existed side by side with Rhabdomancy in many countries, and has often been confounded with it. In fact, they seem to be very closely connected, the history of their origin being almost identical; for whilst the divining-rod is

¹ Sale's *Koran*, cap. xxviii. p. 319, note.

² See *Athenaeum*, Aug. 31st, 1875: Article, “*Cursor Mundi*.”

traced to the golden rod given to Mercury by Apollo, the divining arrow, which was also of gold, was given by Apollo to a mythical personage named Abaris, who is said to have come from the land of the Hyperboreans to Greece in the time of Pythagoras, in consequence of a terrible pestilence, which could only be remedied by offerings to Apollo made in Athens for all nations. Abaris, the Hyperborean, was the ambassador from his own country, and he then received from the god this magic arrow. By means of this arrow Abaris could transport himself instantaneously over land and sea as on a horse. Mercury is also said to have used the Caduceus in this manner, so that it may well be that Abaris is but a later form of Mercury, and that in the rod of the one and the arrow of the other, we see the origin of the witch's broom-stick.

It is, at all events, matter of history that arrows marked with certain signs were used in divination among the Scythians, Chaldaæans, Arabs; and Tacitus (*Germ.* 10) says, among the Germans also. We find this superstition imbedded in a tale which is said to be widely current in the east of Europe, and exists also in the collection of stories of the Turkish races in South Siberia, edited by Radloff.¹ According to this tale—"When the hero, who has descended into the lower world, and has been left there by his faithless companions, saves a brood of eaglets from a dragon,² he is eaten up by the hasty mother eagle on her return. But as her eaglets weep at the sight she spits him out again. In the end he calls upon his treacherous comrades to join with him in shooting arrows straight up into the air by way of ordeal. His arrow strikes the ground before him, but theirs fall back upon their heads, and they die."

Lebrun says, quoting from Thevenot's *Voyage in the Levant*, that—"Among the Turks, people may be seen

¹ *Gipsy Folk Tales*, Von Dr. Franz Nuklosich.

² The reader will not fail to observe in this tale the constantly recurring enmity between the eagle and the serpent or dragon, referred to in a former chapter.

seated on the ground with a number of books spread on the ground round them. They take four arrows cut to a point, and place them in the hands of two persons; then they place upon a cushion a naked sword, and read a certain chapter of the Koran, during which these arrows fight together, and victory is divined to the party, after which the victorious arrows are named, and they never go to war without trying this mode of divination."

The Koran probably refers to this in the chapter which says—"O true believers, surely wine and lots, and images and divining arrows, are an abomination of the work of Satan, therefore, avoid them, that ye may prosper."¹ In the preliminary discourse (p. 127), we are told that the arrows used for this purpose were like those with which they cast lots, being without heads or feathers, and were kept in the temple of some idol in whose presence they were consulted. Seven such arrows were kept in the temple of Mecca, and were found in the hands of Abraham and Hobel by Mahomet, but generally in divination they made use of three only, on one of which was written, "My Lord hath commanded me"; on another, "My Lord hath forbidden me," and the third was blank.

Divination by means of arrows was practised by Nebuchadnezzar (Ezek. xxi—21); and Potter tells us that this superstitious practice of divining by arrows was used by the ancient Greeks and other nations.²

There would appear to have been a certain amount of sacredness attached to arrows among the Mexicans, although it is not stated that they were used in divination, for Bancroft writing of the Festival of the month Quecholli, dedicated chiefly to Mexicoatl, god of the chase, says—"Canes were gathered, and carried to the temple of the god of war; there young and old assembled for four days to share in the sacred work of making arrows. The arrows were all of uniform length, and were formed into bundles of twenty, carried in pro-

¹ Sale's *Koran*, v. p. 94.

² Potter's *Antiquities of Greece*, vol. i. p. 334.

cession to the temple of the god, and piled up in front of the idol.”¹

The description given of the divining arrows serves to connect them with the very smooth straight sticks which the Alani women are described by Herodotus (iv. 67) as gathering and searching for anxiously, and also with those bundles of myrtle stick with which the Persian Magi, according to Strabo (xv. cap. 3, p. 136), touched their sacrifices, holding them in their hand during their prayers and incantations. These twigs were also held before the perpetual fire on their altars as an act of worship, and there is a very obvious connection between both these ceremonies and that very ancient and well-nigh universal practice of casting lots.

Among the Anglo-Saxons, lots consisted of pieces of wood from a fruit-bearing tree, which were cast into a white cloth, and this mode of divination, or casting of lots by means of the twig or *tan* as it was called, was common to all Northern nations, derived, it is said, from the Scythians; but that which will be of especial interest to the ethnologist, is the fact that at the present day the Hottentot children cast lots by twigs as our Anglo-Saxon ancestors did; that is, if a thing is lost, or a theft has been committed, they throw bits of stick, and judge of the culprit, or of the direction wherein the lost property is to be found, by the arrangement of the twigs; and among the Kaffirs bundles of sticks and assegais are employed by the diviners in their rites for the discovery of crime. Among South African peoples also, two bones are used in casting lots, being evidently the primitive form of dice, which can be traced back in their present form to a very remote antiquity, and which, as well as the divining-rod, are connected by legends with Mercury.

But probably the most important and significant fact connected with the use of rods, twigs, and arrows in divination, is their very evident bearing upon some of the ancient alphabets. It is impossible to look at the primitive alphabets such as the Phoenician, the Etruscan,

¹ Bancroft's *Native Races of the Pacific*, vol. ii. p. 335.

the Runic, without being struck with their resemblance to twigs or branches of trees variously arranged. It is worthy of note that the invention of letters is attributed by tradition to the same gods who are famed for their knowledge of magic arts. Thus the Egyptian hieroglyphics are said to have been invented by Thoth, Taaatus, or Hermes, the prime minister of Osiris, who is identified with the Greek Hermes, the Roman Mercury, and also with the Scandinavian Woden, to whom the invention of Runes is attributed both by the Scandinavians and Anglo-Saxons.¹

The connection of Hermes or Mercury with all kinds of magic, but particularly with divination by the rod, has already been shown, and in tracing the magic powers ascribed in early times to letters or runes, it seems obvious that the veneration for the latter arose from their formation from the sacred rods and twigs employed in lots and divinations. The word *rūna* comes from a word *Iker-ru*, which signified a secret, and from the same word was derived *rynan*, to whisper; *rūna*, whisperer; in earlier times a *magician* and *runstafas* were mysterious staves.

The magical virtues ascribed to runes are well known. "They were divided into *bitter runes*, employed to bring various evils on their enemies; the *favourable* which averted misfortune; the *victorious* procuring conquest to those who used them; the *medicinal* which were inscribed on the leaves of trees for healing; others served to dispel melancholy thoughts; to prevent shipwreck; were antidotes against poison; preservatives against the resentment of enemies, and efficacious to render a mistress favourable."² We are told that at Lassa (Thibet) sometimes the Shamas divine by tracing on a leaf the eight figures *koua*, and certain Thibetan words;³ and Lenormant, in detailing the attributes of Wäimämöinen (the friend of the watery element), the atmospheric god of

¹ On the *Hwiting Treow* of the Anglo-Saxons. *Archæologia*, vol. xlvi.

² Migne, *Dic. de Mythologie*, p. 223.

³ Mallet's *Northern Antiquities*.

the Finns, whom he compares with the Ea of the Chaldaeans, says—"He is not only king of the waters and of the atmosphere, but the spirit from which flows all life, the master of all favourable enchantments, the vanquisher of all evil, the sovereign possessor of all science. It is he who communicates to men the celestial fire, invents music and incantations. The sweat from his body heals all sickness. He alone can furnish efficacious aid against the charms of sorcerers. He also is the sole depositary of the 'runes of science,' those 'supreme words,' 'creative words,' which he sought in the bosom of the ancient Wipunen, words which give life to all which exists, whose power restrains the gods as well as inferior beings. These words, like the mysterious *name* of the books of Accad, are the last words of supernatural science; the enchantment which is superior to all others, and they possess in themselves a supreme virtue independent of him who pronounces them."¹ It is probable that these mysterious words or signs were marked on the rods used in divination, and imparted to them their virtues. "Thus Galen mentions one Pamphilos, who had written that by means of certain sentences and magic formulæ, he could very much increase the virtues of herbs," and says of the Chaldaeans that—"They also frequently used talismans inscribed with various images and symbols, which not only were to prevent and cure sickness, but also and especially for soothsaying."²

The twigs used as lots by the Anglo-Saxons were marked with certain signs, and General Pitt-Rivers has pointed out the marks made upon their arrows by the Eskimo, perhaps as tokens of ownership, but not improbably also as magic signs, since they are much given to divination; and it is not a little remarkable that the sign chiefly employed on divining-rods and arrows, both in ancient and modern times, is that of the cross, which in the older mythologies is generally the

¹ Kalewala, i. 9, 10, in Lenormant's *Magic among the Chaldaeans*, &c., p. 216.

² Ennemoser's *History of Magic*, p. 224.

symbol of water, or of the god of the atmosphere. This perhaps explains the connection between the divining-rod and water, whilst the form of the rod employed in the search for water may perhaps have some connection with the Etruscan legend, which relates that—"An Etruscan ploughman happening to drive his share somewhat deeper than usual, was surprised by the sudden appearance of a boy from beneath the ground. The worthy rustic alarmed the neighbourhood, and in consequence all Etruria resorted to the spot and learned from the lips of the subterranean stranger, who was no other than a god Tages, the doctrines of divination, which were afterwards carefully committed to writing."¹ Hence the Etruscans claimed to be the originators of divination, but that as well as the letters of the alphabet came to Europe apparently from the East.

This subterranean god would seem to have some connection with the Greek Python, for we are told that those who retained the superstitious customs connected with that worship in Christian times were accustomed to offer a certain perfume, and to move in the hand a magic wand, or divining-rod of myrtle, uttering certain words. Then he who held the rod stooped down as if to consult some one who was underground, and who answered him in so low a voice that he could only understand the spirit of the response, without hearing anything distinctly;² and a further trace of this subterranean divinity may probably be found in the word Runa, which Mallet, in his *Northern Antiquities*, derives from the root Mandragora, designated in Old German *Alraun*, which root resembles, as is well known, the commonly received form of the divining-rod, and around which cluster a number of old-world superstitions, even to the present day, for it is probable that in many places shrieks and groans would still be expected to follow its forcible extraction from the earth. If I am not mistaken, this root figures in different positions in two or three letters of the Runic alphabet, in which also

¹ *Encyclopædia Metropolitana*: Article, "Divination."

² Maimonides, *Traité de l'Idolatrie*. Lebrun, tom. ii. p. 402.

the arrow occurs as representative of the god Tyr. Runes, say travellers, are to be found in Tartary, which certainly is not surprising, if we can trace them to the sticks used in divination, to which all Scythic nations were so much addicted. "Grimm has shown that the Anglo-Saxon Runic alphabet was derived from the Scandinavian, at a period when it had only sixteen letters, and he then attempts to trace the sixteen original runes to a remote Asiatic source, founding his conjectures on their inadequacy to express all the sounds of the Old Norse language, and therefore assuming that they must necessarily have been borrowed from a more primitive tongue."¹ In tracing the ancient alphabets to rods used in divination, it is not without interest to remark, that "of the eighteen letters which at present compose the Irish alphabet, sixteen bear the same name that designate sixteen common trees and shrubs found in the island." "They tell us that the early inhabitants of Ireland brought the knowledge of those letters with them to Ireland, and that these came from a southern region where Irish trees were unknown."² The writer in the *Ulster Journal of Archaeology*, from whom I have just quoted, goes on to say that—"These letters appear to have been originally only sixteen, the same number Cadmus brought to Greece; and that the Irish alphabet has these eight letters less than the Roman, is an unanswered and unanswerable argument against the idea of Ireland having received her elementary characters from Latin sources any more than from the meridian age of classical Greece."³ In a note on Mr. Kemble's paper on Anglo-Saxon Runes, it is remarked as a singular coincidence that in Welsh the alphabet was called "The lot of the Bards."⁴

That a very intimate connection subsisted between the arts of divination by rods or arrows, the casting of lots, and the primitive alphabets, cannot, I think, be doubted. It is a significant fact that just in those

¹ Mallet's *Northern Antiquities*, p. 23.

² *Ulster Journal of Archaeology*, vol. iii. p. 15.

³ *Ibid.*

⁴ *Archæologia*, xxviii.

regions of Asia where arrows were principally used in divination, there we find the cuneiform or arrow-headed characters in use.¹

It would moreover appear that both divination and the primitive alphabets originated with that very early semi-civilized race, which seems to have spread over the whole world prior to the rise of Aryan supremacy, a race generally, although perhaps not very correctly, denominated Turanian, and which has certainly left traces in the language, religion, and customs of almost all nations quite alien to Aryan culture.

This race, by whatever name it may be designated, may, I believe, be identified with that serpent race of which I have treated in a previous chapter as the originators of agriculture and metallurgy in their earliest form.

Maurice, in his *History of Hindostan*, says—"Naga, in its primary sense, signifies *diviner*. The pre-Aryan population of India, and the Scythians, pre-eminently diviners, doubtless belong to this race, as did also the Etruscans, according to Canon Isaac Taylor, and they likewise were noted as soothsayers and diviners. Lenormant traces an underlying Turanian population in Chaldæa, Persia, and among the Eskimo. Ethnologists find remnants of the same race among the short dark peoples of Europe, especially in Ireland, and it may be laid down as a general rule that wherever these are found there also will the arts of divination yet linger.

In America, to which I believe this race may be

¹ The author of the article on Alphabets in the *Encyclopædia Britannica* says—"It seems clear that the origin of this (cuneiform) system was Turanian, and that it was borrowed by the Semitic races who used it. Cuneiform characters were used in Persia, Assyria, Babylonia, and also among the old Scythian population of Media, who used a Turanian speech." Speaking of *runes*, the same writer says—"It is probable both from the meaning of the word *Rune* (a secret), and from the evidence of foreign writers, that these symbols were not used by their owners for any of the ordinary ends of an alphabet." Runes were cut on smoothed ash boughs, and were used as magical symbols and also as means of augury, and for this reason they were proscribed to Christians.

traced by the arts of agriculture and metallurgy, I have already pointed out the symbols of divination, the ring and staff and the forked stick as sculptured on the rocks in Peru, whilst everywhere, but especially in Mexico and Central America, may be seen the pre-Christian cross, the symbol there, as in the Old World, of the elements, and particularly of water; but intercourse with America would appear to have ceased before that further development of divining-rods, twigs, and arrows into alphabets, since the American system of writing was by hieroglyphics.

It appears to me a subject worthy of investigation whether there really exists among the races designated *inferior* a certain power which has been eliminated from the more highly-developed Aryan. It cannot be denied that certain of the lower animals are endowed with faculties (or instincts) far more keen than can be found in the human race, although some of these are shared to a small extent by savages, and it may well be that those more nearly allied by blood to the earlier races, may retain more of those occult affinities with nature shown by the lower animals, than the highly-cultured man of civilized Europe. After making every possible allowance for trickery, the effects of imagination and religious excitement, there remains a substratum in the marvels related of the old magicians of Egypt and Chaldea, and in those of their modern representatives in India and elsewhere, which has never been satisfactorily accounted for by the teachers of science. In this category may be placed the successful use of the divining-rod in the present day, and that singular magnetic influence, which under the name of hypnotism is now making so great a sensation. These things, however, belong rather to psychology than to anthropology, and must be left to scientific investigators. My endeavour has been rather to trace the origin and geographical distribution of a curious superstition and its bearing upon early inventions, than to investigate the truth or falsehood of an assumed power.

CHAPTER XI.

BIRDS IN THE MYTHOLOGIES OF VARIOUS RACES.¹

Birds as Symbols of Ancient Divinities—The Goose—Sacred in India, Ceylon, Egypt, Rome, and Ancient Britain—A Turanian Totem—Transformed into the Swan among Aryans—The Peacock in India—Emblem of Juno denoting her Eastern Origin—The Owl of Evil Augury—Minerva's Owl perhaps the Cuckoo, or Minerva the Chief Divinity of Owl Tribe—The Phœnix—An Astronomical Myth—The Hawk in Egypt, India, and Persia—Fijian Legend—Mexican Bird-Serpent—The Vulture, Emblem of Maut—Worn as Head-dress in Egypt and China—Bird of Augury—The Cock—Symbol of Osiris and Durga—Sacred to Mars, Apollo, and Esculapius—Of Sepulchral Significance in Etruria—Sacrificed to the Sun in Scotland—The Dove the Bird of Venus—Symbol of the Soul in Etruria—Connection with the Mundane Egg—The Eagle—Special Symbol of Aryan Races—Legendary Antipathy to Serpents denotes Race Antagonism—The Eagle in Mexico and in India—Legend of the Mundane Egg in many Lands.

BIRDS were used as emblems of almost all the very ancient divinities; but, notwithstanding the great variety which have thus been employed, it seems possible to select some birds as peculiarly adopted by certain races, so as to render their presence in the mythologies of other races, ground for a belief in an admixture, or of the conquest, of one by the other. Among Turanian races, I think we shall find a preference given to the goose or swan, the hawk and the peacock; among the Semites, to the dove; and among the Aryans, to the eagle; and although these birds are often supplemented by others, yet they stand out as more decidedly distinctive of race than any others.

¹ See *Journal of the Anthropological Institute*, February 1875.

I.—Closely following in the track of the serpent, often, but not always, associated with, and generally running parallel to it, we find the Hansa, or sacred Brahminical GOOSE, still adored in Ceylon and Burmah, and which appears to have been almost the earliest bird to receive divine honours. On all the temples of India whereon the worship of the serpent is delineated, the goose also occurs as an ornament, or as in some way connected with the mysterious worship of that deadly reptile. Sir E. Tennant says—"There is something still unexplained in the extraordinary honours paid to the goose by the ancients, and the veneration in which it is held to the present day by some of the Eastern nations." The figure that occurs so frequently on Buddhist monuments is the Brahminical goose (*casaraka rotila*), which is not a native of Ceylon, but from time immemorial has been an object of veneration there and in all parts of India. Among the Buddhists¹ especially, the hansa has attracted attention by its periodical migrations, which are supposed to be directed to the holy lake of Manasa in the mythical regions of the Himalaya. The poet Kalidasa, in his *Cloud Messengers*, speaks of the hansa as "Eager to set out for the sacred lake." Hence, according to the Rajavali, the lion was pre-eminent among beasts, but the hansa was king over all the feathered tribe. "The goose is at the present day the national emblem emblazoned on the standard of Burmah, and the brass weights of the Burmese and Javanese are generally cut in the shape of the sacred bird, just as the Egyptians formed their weights of stone after the same model."² Sir Gardiner Wilkinson thinks that the Egyptians did not pay divine honours to the goose, although it was the emblem of Seb, the father of Osiris, but upon this see note by Dr. Birch, in Sir E. Tennant's *Ceylon* (p. 487). The reason assigned for the veneration in which this bird was held by the ancients, is its fondness

¹ It is remarked that Buddhism is peculiarly the religion of Turanian races.

² Tennant's *Ceylon*, p. 484.

for its young. Aristotle praises its sagacity, Ælian dilates on its courage and cunning, and its attachment to man, and Ovid ranks the goose as superior to the dog in the scale of intelligence; it was, as we know, one of the emblems of Juno, and it was the sacred geese kept in her temple which saved the Capitol from the invasion of the Gauls; but it is a singular fact that this superstitious veneration for the goose, which seems to have originated in the East, had found its way to Britain before the time of Cæsar, who relates "that the ancient Britons held it impious to eat the flesh of the goose"; yet Wilkinson tells us that it was eaten largely in Egypt, even in those places where Seb, to whom it was sacred, was worshipped. Leslie, in his *Early Races of Scotland*, says, "The glorification of the goose in the West was by no means confined to the Britons, who did not derive this feeling from, although they shared it with, the classical nations of Europe," and in commenting upon the figures engraved on the Scottish stones, adds, "In the Pagan and Planetary worship of Ceylon, three of the figures commonly traced by the person who performs the ceremonies are, the elephant, the goose, and the crescent for the moon, and all these emblems are found on the Scottish stones." Finding such peculiar emblems in two countries so remote from each other as Ceylon and Scotland, and knowing that in the latter country elephants have not existed, at least, during the historic period, the question naturally arises how the superstitions of Asia could have found their way to a land so unknown and barbarous as we are apt to imagine Scotland to have been at the period which the most moderate computation assigns as the date of the erection of these Scottish stones. That there must have been a direct intercourse is evident, for it seems impossible that the same symbols could have originated spontaneously in two countries wholly unconnected, and in one of which the elephant was wholly unknown.

That the superstitious veneration for the goose originated among a Turanian people in the age of

Totemism seems certain, when we observe how it still lingers among that race in Asia, and there only among the Tamul-speaking people. Fergusson, in his *Tree and Serpent Worship*, shows us that wherever the Dasyus or Aborigines are represented at Sanchi in water-scenes, there are geese represented also; but they are not seen with the Hindus.

Then it appears also to have been intimately associated with the serpent-myth and the doctrine of the mundane egg; it has been seen that it co-existed with that venerable myth in Britain before the time of Cæsar, whose words are confirmed by existing monuments on which both symbols are found together, a similar conjunction occurring in a bronze knife or dagger of serpentine form having a goose for the handle, discovered in Denmark,¹ as well as in the sculptures of India and Ceylon as already pointed out; but the goose does not appear ever to have been so universally adored as the serpent. It was perhaps the totem of some early powerful Turanian tribe, adopted by alliance into some serpent tribes, but not necessarily supplemental to the serpent everywhere. Thus I have failed to trace it in many countries where the serpent-myth undoubtedly prevailed, whilst in others it was evidently connected with it. Whenever it does appear, it is always an emblem of the most ancient of the gods, having an Eastern and pre-Aryan origin; thus in Greece, and afterwards in Rome, we find it among the symbols of Hera or Juno, a goddess whose whole surroundings are Eastern, and who is often spoken of as the first-born of Chronus or Saturn, being certainly older than Jupiter, and who may be identified with Saraswati, the sacti or consort of Brahma, whose emblem was also the goose or swan, and these two Indian divinities are said to have formed the great mundane egg.

There are circumstances in the history of Brahma which would lead us to suppose that he was adopted into the Hindu mythology from an earlier race, for although he is looked upon as the creator, he has no

¹ Sir John Lubbock's *Pre-historic Times*, p. 34.

temples, and comparatively few worshippers among the Hindoos; then also his connection with the mundane egg seems to denote his pre-Aryan origin, for it is remarked that the doctrine of the mundane egg belongs only to the earliest cosmogonies. (See an article on "Demonology" in *Fraser's Magazine* for November and December 1872.) Moor, in his *Hindu Pantheon*, observes that Brahma is never seen seated on his emblem or vehicle, as other gods are, but he gives an example of Saraswati, his consort, seated upon a paddy-bird instead of a goose, observing that this bird is likewise denominated Hanasa in India, and that the same name (Hahnsy) is applied to the heron in some parts of England. Sir E. Tennant likewise tells us that the ibis is denominated Abou-Hansa by the Arabs, and this similarity in the names of different birds may account for some confusion which may be observed in their mythological use.

II.—Moor gives the goose or SWAN as the emblem of Brahma, and here too we may trace the engrafting of Aryan myth upon a Turanian stock. The goose was undoubtedly the original symbol, as seen by the ancient monuments of India, Ceylon, and Britain; but the Aryans transformed this goose into the more graceful swan of the northern hemisphere, and henceforward the goose disappears, excepting among the aborigines, or is looked upon with contempt, and all the later legends cluster round the swan, making that a bird of mystery and romance, whilst the goose is looked upon, as the pelican was of old, as the type of a fool; yet a singular instance of a survival of old beliefs may be noted here, for we are told, that the first crusaders marched to battle led by a goose and a goat, which they asserted were filled by the Holy Spirit. The swan-legends are chiefly traceable to the north, the native home of the swan, but there is an Indian myth of the Apsaras or swan-maidens, who are supposed to be impersonations of the cirrus clouds. Mr. Baring Gould, in his *Myths of the Middle Ages*, supposes the Greek Muses to be representatives of the Indian

Apsaras, and relates the Cyprian legend in which Nemesis, flying in pursuit of Zeus, took the form of a swan, and dropped an egg from which issued Helen, and quotes many mediæval legends in which maidens are transformed into swans; and to one of these Godfrey of Bouillon traced his origin. It would be interesting to discover whether the red swan of the American Indian tradition, supposed to represent the setting sun, as given by Longfellow in his song of *Hiawatha*, is really a swan or the red goose of the Nile, and thus another link between the Old World and the New.

III.—Saraswati, the consort of Brahma, is sometimes seen mounted on a PEACOCK, which bird, next to the goose, plays a conspicuous part in Eastern tradition. The peacock is the emblem in India of Kartika, the Indian Mars, the second son of Brahma and Saraswati, of whom a legend is related that "he sprang from the central eye of Siva, to destroy the giant Souraparhma, whom he cut in two, and the severed monster assumed the shape of a peacock and a cock, the former of which the victor determined to use as a vehicle, and the latter to be borne in his standard." The connection between the peacock and the goose is alluded to in a *jataka* still found in Ceylon, which is given by Fergusson in his *Tree and Serpent Worship*. The royal Hansa assembled all his subjects in an extensive plain, that his daughter might choose a husband from among them. She choose the peacock, at which the vain bird was so elated that he raised his tail and made such a display as to disgust the king, who, in consequence, broke off the match.

Pococke says, "The peacock," according to Colonel Tod, "was a favourite armorial emblem of the Rajpoot warrior; it is the bird sacred to their Mars (Kumara), as it was to Juno, his mother, in the West."¹ The peacock plume is still a warlike badge in China and Japan, and fans of peacock feathers are carried before Eastern monarchs, as they are also before the Pope. The fact of Hera or Juno having both

¹ Pococke's *India in Greece*.

the goose and the peacock assigned to her, serves not only to denote her Eastern and pre-Aryan origin, but also to identify her with Saraswati or Brahmi, the sacti or consort of Brahma, whose attributes in the Greek and Roman mythologies seem to have been divided between Juno and Minerva. Argus the hundred-eyed, Juno's watchful messenger, whose eyes she transferred to the peacock, bears a strong affinity to the Indian Indra, the watchful guardian of the heavens, the regent of the winds, who is always represented as covered with eyes; and it must be noted that Juno had evidently some connection with atmospheric phenomena, the rainbow being her constant attendant.

IV.—It is strange that the bird assigned to Minerva should have been the owl, which all over the world is deemed a bird of ill omen; so much so, that in India, at the present day, if an owl alights on the hut of a native, it is burnt or pulled down as polluted. In the Indian zodiac, the headless Rahu, representing the Dragon's tail, is seated on a brown owl. We read in the *Universal History*, that "The Arabs held the owl in great abhorrence, as imagining that it always brought ill news and portended something bad;" but there is an owl tribe among the Konds of India, and it is frequently represented in Egyptian hieroglyphics, although it does not appear to have been among the sacred animals.

In Prescott's *Mexico* we read—"The Mexicans, according to Clavigero, believed in an evil spirit, the enemy of the human race, whose barbarous name signified 'rational owl,' and the curate Bernaldez speaks of the devil being embroidered on the dresses of the Indians of Columbus in the likeness of an owl;" but among the Mexican antiquities I find no representation of this bird, unless a bird resembling the cuckoo be intended for it. "The owl was regarded by Aztecs, Quichés, Mayas, Peruvians, Araucanians, and Algonquins, as sacred to the lord of the dead, and was one of the names of the Mexican Pluto, whose realm was in the north. As the bird of night, it was a fit emissary

of him who rules the darkness of the grave."¹ At first it seemed to me probable that Minerva's bird was originally the cuckoo, which we find constantly associated with divination and augury, and which is one of the birds assigned to Juno; and this I imagined from the fact that to Athena or Minerva is assigned the instruction of mankind in the useful arts, particularly agriculture, and if my theory of the origin of the use of metals be correct, then the serpent, being one of her emblems, would connect her with the primitive serpentine race of metal-workers. We are told that even now, in some parts of Germany, the call of the cuckoo is thought to disclose mines; and certain plants, the cuckoo-bread and cuckoo-flower, are believed to grow in most luxuriance where the depths of the earth are rich in metal.² But Dr. Schliemann's discoveries of owl-headed divinities on the supposed site of ancient Troy, would serve to show that Minerva's bird was really the owl, as connected with the rising sun; or rather, perhaps, that she was the chief divinity of an ancient owl-tribe, and was thus represented in these ancient sculptures with the form of her totem. Brinton suggests that the owl obtained a character for wisdom, because she works while others sleep.

V.—One of the most celebrated mythological birds of Eastern origin was the PHœNIX, which Philostratus says came from India to Egypt, adding that the phœnix, when about to burn himself, sings a dying hymn, which recalls to us the fable of the death-song of the swan, which is associated with the phœnix in some traditions.³ Traces of the phœnix are found in China, where it is called Fong-Hoang, the bird of prosperity, and the forerunner of the golden age;⁴ but it was in Egypt that the legend obtained its greatest celebrity. It is thus given by the Rev. J. H. Ingram in

¹ Brinton's *Myths of the New World*.

² *Quarterly Review*, July 1863: Article, "Sacred Trees and Flowers."

³ Creuzer's *Religions de l'Antiquité*.

⁴ Du Halde's *China*.

the *Pillar of Fire*—“The phœnix, of which there is but one in the world, comes flying from the East once in 651 years, many other birds bearing it company. It reaches Heliopolis, the city of the sun, about the time of the vernal equinox, where it burns itself upon the roof of the temple, in the fire of the concentrated rays of the sun as they are reflected from the golden shield thereon with consuming radiance. No sooner is it consumed to ashes, than an egg appears in the funeral pyre, which the heat which consumed the parent warms instantly into life, and out of it the same phœnix comes forth in full plumage, and flying away, returns no more till 651 years have expired. This myth is supposed to relate to the transit of the planet Mercury, which once in 651 years enters the flames of the sun on nearly the same day of the year.”¹ There can be no doubt that some astronomical fact was veiled beneath the allegorical phœnix, but it would seem to me rather to symbolize the belief of early astronomers in the destruction by fire and new creation of the world after certain lengthened periods. Rawlinson, in his edition of *Herodotus*, tells us that the “Benno,”² or bird of Osiris, was the true phœnix, and represented the pure soul of the king.”

VI.—But probably the most sacred of all the birds of Egypt was the HAWK or osprey, the emblem of Ra, the sun, who is often represented as a man with the head of a hawk, surmounted by a globe or disk of the sun, from which the Uræus or sacred asp issues.³ Kneph, the great god of the Egyptians, is represented

¹ The period assigned to the phœnix varies from 800 to 1461 years, according to different authors.

² This Benno was a species of ibis or stork, and here we probably get a clue to the confusion existing between the hansa or goose, the swan and the ibis. It has been seen that the goose was sacred to Seb, the father of Osiris; hieroglyphically it denoted a son, and it would seem natural that the son should assume the father's totem; but probably from the superior usefulness of the ibis in Egypt, it would in time supersede the goose, and become identified or confounded with the older emblem.

³ Wilkinson's *Ancient Egyptians*.

as a serpent with the head of a hawk. Porphyry says—“The hawk was dedicated to the sun, being the symbol of light and spirit, because of the quickness of its motion and its ascent to the higher regions of the air”; and the *Universal History* tells us that “The hawk was deified because one of those birds in ancient times brought a book to the priests of Thebes, tied round with a scarlet thread, containing the rites and ceremonies which were to be observed in the worship of the gods; for which reason the sacred scribes wore a scarlet fillet with a hawk’s feather on their heads.” It is singular to find this story reproduced in an Indian fable, in which the eagle of Krishna (who is an incarnation of Vishnu) pursues the serpent (Buddha) and recovers the books of science and religion with which he had fled. Upon which Pococke observes, “Did Buddha or Mercury come from or escape to the Nile? Is he the Hermes of Egypt, to whom the four books of science, the Vedas of the Hindoos, were sacred?”¹ It must be remembered that the first Avatar or incarnation of Vishnu in the form of a fish was in order to recover the sacred books from the ocean, the emblem of Vishnu being the man-eagle Garuda, probably originally the hawk or Brahmany kite. In Persia we find the hawk used as emblematic of Ormuzd; and it is very remarkable to find the hawk in connection with the primogenial egg, and the serpent, showing itself in the traditions of Fiji, where, we are told, “Their account of the creation is that a small kind of hawk built its nest near the dwelling of Ndenei (their serpent god), and when it had laid two eggs the god was so pleased with their appearance that he resolved to hatch them himself, and in due time were produced two human infants, a boy and a girl.”² A legend of the Quichés, attributes the creation to the bird-serpent, and the picture writings of the Mixtecs preserved a similar cosmogony. Two winds, called the nine serpents and the nine caverns, are represented as a bird and a

¹ Pococke’s *India in Greece*, p. 188.

² Williams’ *Fiji and the Fijians*.

of late or early date I know not. It is thus given in Moor's *Hindu Pantheon*—"Agni arriving in the presence of Siva, and assuming the form of a dove, received from him the germ of Karticeya (Mars), but, unable to retain it, let it fall into the Ganges, on the banks of which river arose a boy, beautiful as the moon and bright as the sun, who was called the son of Agni (Fire)." The dove appears frequently in Etruscan tombs, and Dennis says: "It is supposed, not without reason, that the souls of the deceased are sometimes symbolized on the monuments as birds, especially doves." That doves were emblems of divinities in Oriental mythology is well known; Mithras, the great deity of the Persians, was so symbolized. In Arabia we are told that among the idols of the Caaba there was a wooden pigeon, as likewise another above, to destroy which Mohammed lifted Ali upon his shoulder.¹ But the fable of the dove seems to have originated in Syria, where it was connected with the birth of Astarte or Aphrodite, hence called Dea Syria.²

Of Semiramis the legend says that she was the daughter of the fish goddess, Derceto, who, being exposed by her mother, was miraculously preserved by doves, and, after a long and glorious reign over Babylon, disappeared from the earth, taking her flight to heaven in the form of a dove. In this fable we see the connection between the soul and the bird, which is common to so many races, and also the birth of the Goddess of Beauty from water, which is related of the Greek Aphrodite, the Roman Venus, the Syrian Astarte, and is traceable in India, where Rhemba, of Indra's court, who seems to correspond with the popular Venus, the Goddess of Beauty, was produced, according to the Indian fabulists, from the froth of the churned ocean. The connection between this goddess and her doves with the mundane egg is very remarkable. In India this egg is produced by Brahma, whose emblem is the goose or swan; in Syria it is transferred to the dove.

¹ *Universal History*, vol. xxviii.

² *Encyclopaedia Britannica*, sub voc. "Mythology."

In the Chinese legends the earth egg floats hither and thither upon the waves until it grows to a continent. In the Finnish epic of Kalewala the eagle floated over the waves and hatched the land. In Scandinavia the earth is formed from the flesh of the giant Ymer, and set to float like a speck on the vast sea between Mispel and Nitheim. But wherever these legends of the mundane egg are found, they may be traced to that old Turanian cosmogony which makes the world resemble an egg in form, having its origin in the water. Eggs were formerly suspended in many temples, and we are told they are still so suspended in mosques. Both ostrich and hen's eggs are found in the tombs of Etruria, sometimes painted or carved, and sometimes imitated in pottery,¹ and thus a veneration for eggs may be traced downwards from the early Turanian races, among whom they were revered as the source and origin of all things, to our own Easter eggs, typical of Christ and the resurrection.

X.—It is when we come to consider the EAGLE, the king of birds, that we find ourselves gradually emerging from the dark night of mythology. We have seen the hawk or osprey revered in Egypt as the emblem of Osiris and other gods in their character as sun deities, we have seen the same bird in distant Fiji producing the primogenial egg, and we find it in India as the emblem of Vishnu, the preserver. It is in this latter country that we can trace most clearly the process whereby the hawk, revered by Turanian races, became converted into the eagle, the chosen type of the Aryans in all countries. The Garuda, or eagle of Vishnu, evidently remounts to the age of Totemism. It is represented both in sculptures and paintings as a man with hooked nose and eagle's wings and talons; even when he bears Vishnu on his shoulders he is still only a winged man. In the Elephanta cave, Vishnu is represented as seated on, or bestriding, Garuda's shoulders, with his legs in front, Garuda holding him on by the ankles, and Garuda is represented as a winged man, with a wig,

¹ Dennis's *Cities and Cemeteries of Etruria*.

hooked nose, and eagle's claws. It was the part of Vishnu and his consort, Laksmi, to preserve the mundane egg, formed by Brahma, from destruction, when cut in half by Siva, the destroyer. There can be little doubt that these three famous Indian gods are subdivisions of one primary god of nature. They and their consorts are all fabled to have been children of the Indian Isis, or Nature personified, and their connection with the great mundane egg points to a very early pre-Aryan origin. It is easy to imagine that the Aryans, coming from a northern land where eagles abounded, would soon convert the hawk, osprey, or Brahmany kite revered by the natives, into the more familiar and superior bird of their native rocks, and thus we find that the vehicle of Krishna, a later incarnation of Vishnu, is no longer the Garuda, the Totemic divinity, part man, part hawk or eagle, and perhaps part phoenix, but has become a genuine eagle. In his form as Garuda he is known as Nag-anteka, the destroyer of serpents; and this legendary antipathy of the eagle to serpents occurs in many other countries, as in Scandinavia, where the squirrel causes strife between the serpent which gnaws the root of yggdrasil, and the eagle which sits in the branches. The same character is assigned to the eagle in Mexico, where that bird holding a serpent in its beak forms the modern standard.

Now, even accepting Prescott's date (1326) for the foundation of modern Mexico, it is abundantly evident that two or more civilized races occupied the country at a much earlier date. We read of the Mayas, who came from the Antilles when the country was peopled by the Quinamies, to whom the Cyclopean erections still extant are attributed. They were overthrown by Votan B.C. 800. To the Mayas succeeded the Aztecs and the Toltecs. According to existing monuments, one of these races bore a striking resemblance to the Egyptians, both in feature and dress, and doubtless also in religion, the serpent being a very prominent object in their sculptures. The other race is very distinct in feature and dress, the extreme prominence of the nose giving

them almost a Jewish appearance, but in all probability they belonged to the Caucasian race, and bore some affinity to the hook-nosed Garuda, the destroyer of serpents of Indian sculptures, and, in whatever way they got to Mexico, they very evidently carried with them the legend of the serpent-destroying eagle. We find this same widely-spread myth in Greece and Rome, where Zeus or Jupiter, whose special emblem was the eagle, wars with and overcomes the Titans, who were serpentine divinities, represented as such, by their lower extremities terminating in serpents' tails. It existed also in Egypt, but there it is represented by the hawk-headed Horus piercing the gigantic serpent, Apophis.

It appears to me that, tracing this myth in all countries, it represents the conquest of aboriginal or long-established tribes by superior and generally Aryan races. The serpent was the undoubted emblem of a Turanian people, and it was adopted everywhere to symbolize the natives, the sons of the soil, aborigines, as they might well have been deemed by the conquering race, although perhaps in many cases they too were settlers, the pioneers of that Turanian civilization which would appear from all existing traditions and monuments to have been carried by larger or smaller bodies of emigrants, from Central Asia over a great part of the world, introducing wherever they went sun-worship, commingled with that of deceased ancestors, the egg and serpent cosmogony, a knowledge of the rudiments of metallurgy, astronomy, cyclopean architecture, and the construction of mounds and tumuli, developing later into the pyramid.

Perhaps a more careful and elaborate inquiry into these matters will enable us in time to affix some approximate date to those early migrations which undoubtedly took place in pre-historic times, and the countries from which those migrations emanated; but it appears to me that language would here be a very fallacious guide, for supposing, as is most probable, a small band of men, carried unintentionally by some ocean current to a foreign shore; they might indeed

have been received by the rude savages among whom they were cast as gods in human form, and have succeeded in imparting to them their superior civilization; but they could never have imposed upon them their language. On the contrary, they would themselves adopt the language of the multitude, and, being few in number, would in time become so amalgamated with the natives, as to leave behind them only a tradition, and those indestructible records of their connection with the old Asiatic world to be found in monuments, legends, and peculiar customs. These unintentional migrations may have occurred many times in the world's history, at different epochs and from various points, which would account for the variations observable in the civilization of Peru and Mexico, and other American countries which, having had apparently no communication with each other, yet present, in the midst of remarkable differences, certain peculiar points of resemblance.

A glance at a map of ocean currents will show that a frail vessel from the coasts of Asia, drawn into some of these, would be carried by them to the American shore just at those points where the most decided traces of Asiatic civilization are to be found. Undoubtedly one of the many clues to this inquiry will be found in the range of certain mythological birds, which, as I have endeavoured to point out, are peculiarly adopted by certain races. Wherever we find serpent traditions, and with them the egg as the origin of the world or of the primeval pair, there we generally find the goose, the swan, or the hawk, revered as the emblem of the principal divinity, and this goose or hawk is often confounded or identified with the phœnix, which appears to combine in itself the form and plumage of the hawk, the goose, and the peacock, all pre-eminently Turanian birds; and, although we find the egg sacred also in Semitic Assyria in connection with the dove, it is never supposed to have been laid by that bird, nor does it appear in connection with the serpent or the formation of the world; but it is a large egg falling from heaven,

hatched by doves, and from it proceeds, not the world, or the first man and woman, but Astarte or Venus, the Goddess of Beauty, and this change in the character of the egg would appear to me to be owing to the engrafting of later Semitic beliefs upon the old Turanian cosmogony which once flourished in Chaldæa.

Whether the eagle-headed divinity so prominent in Assyrian sculptures was also originally the Turanian hawk, the peculiar emblem of the sun-god in Egypt and elsewhere, or whether it was the germ from which sprang the Aryan eagle, it is difficult to determine; but I should be inclined to think it was at first the hawk, modified later under Aryan influences into the eagle, as was the case with Garuda in India. In Persia the dove was the emblem of Mithras, the sun-god, but we find that the eagle was the royal bird, emblematic of Ormuzd, and we are told by Creuzer, that the chief of the eunuchs always endeavoured to give to the nose of the prince royal the form of an eagle's beak, in honour of Cyrus, whose nose was of that shape.

In noticing the eagle as pre-eminently the bird of the Aryans, two or three marked peculiarities in his history must be borne in mind. First, he is always the emblem of the younger, but more potent, divinities, who have conquered or superseded the older gods; thus he is the emblem of Krishna in India—a late incarnation of Vishnu; and even as Garuda, the vehicle of Vishnu, is called the younger brother of Arun, the charioteer of Indra, the old nature god of the aborigines, and although he is fabled to have sprung from the egg of Diti, the wife of the Indian Casyapa or Uranus, it was only after the lapse of five hundred years when he destroys the serpents, and seizes the water of life.

In Greece and Rome he is the favourite emblem of Zeus and Jupiter, those younger divinities who overcame Chronos and Saturn, and reigned in their stead; but there he never has any connection with the great mundane egg. If this egg appears at all in Grecian and Roman mythology, it is apparently only as a survival of older beliefs, and is always associated, not with

the eagle, but with the swan—the Aryan form, as I believe, of the old Turanian goose. But the great and peculiar characteristic of this bird is his strongly-marked antagonism to the serpent, denoted in India by his name—nag-antika, snake-destroyer—an antagonism which I believe to symbolize an antagonism of race, and to denote the conquest of the old Turanian serpent-worshippers by the aggressive Aryans.

With regard to the phoenix, that enigma of the ancient world, Mr. Tylor gives a Chinese legend, which seems to point to the origin of this myth. “A great sage went to walk beyond the bounds of the moon and the sun; he saw a tree, and on the tree a bird, which pecked at it and made fire come forth; the sage was struck with this, took a branch and produced fire from it.”¹

The sculptures of Nineveh and Babylon, representing the eagle Nisrock perched on the sacred tree or cross, have possibly some reference to the Chinese myth, and we are told in Baring Gould’s *Myths of the Middle Ages*, that in the depths of the forests of Central America, in a palace founded, according to tradition, in the ninth century B.C., there is a sculptured cross, surrounded with rich feather-work and ornamental chains, and above the cross a bird of peculiar character, perched as we see the eagle, Nisrock, on the cross.

In the Athapascan myth, a raven saved their ancestors from the general flood, and this is identified with the great thunder-bird, who brought, in the beginning, the earth from the depths. Prometheus-like, it brought fire from heaven, and saved them from a second death by cold. Precisely the same benefits were attributed by the Natchez to the small red cardinal bird.²

Now the phoenix is undoubtedly the true fire-bird.³ Flying from the East, he goes to immolate himself by fire in the Temple of the Sun, at Heliopolis, and out of

¹ Tylor’s *Early History of Mankind*.

² Brinton’s *Myths of the New World*.

³ The Robin and the Wren are both fire-birds in European myths, and the history of these two birds is full of interest.

his ashes comes an egg, from which proceeds a worm, which rapidly develops into a young phoenix in full feather, who flies away eastward, to return again after five or six hundred years, and himself perish in the same manner by fire. Another version tells us of the newly-born phoenix taking a ball of myrrh of the weight of his father's body, hollowing it out, and enclosing the dead body therein, and then flying with this egg of myrrh to Heliopolis, there to consume it by fire. Now the remarkable thing in this legend is that it seems to combine in itself the germs of all the religions which prevailed in the pre-Aryan world. We see in it, sun-worship and sacrifice by fire to that great deity. We see in it the egg and the worm or serpent, both so highly revered everywhere in the ancient world, and we may also trace in it that reverence for ancestors so characteristic of Turanian races, shown by the care with which the young phoenix embalms his father's body in myrrh, and conveys it to the Temple of the Sun. It seems to me, that to this myth may be traced the form of the Assyrian Nisrock, with the eagle's head and the fir-cone in his hand, indicative of the myrrh egg of the phoenix; and it is not improbable that it may have originated the form of the Garuda of Vishnu, who is represented as half-man, half-bird, sometimes with a red comb and beak, his robe red, his face, arms, and pinions green; the feathers of his wings and tail green and blue; and he is sometimes represented spread and double-headed like the Prussian eagle.¹ The phoenix may also have had some connection with the old Mexican deity, Quetzalcoatl, whose name we are told signifies green-feathered serpent, and who is often represented as a man with green plumes and tail like a bird, having also some affinity to the humming-bird, perhaps because the brilliancy of the plumage of this little winged gem would recall the fabled glories of the Eastern phoenix. It is certain that among Egyptian sculptures the phoenix is sometimes represented as a winged man, with a tuft of feathers on his head.

¹ Moor's *Hindu Pantheon*.

"It was probably," says Brinton, "the eagle which was worshipped in Upper California, under the name of Panes. But," he adds, "Father Geronimo Boscana describes it as a species of vulture, and relates that one of them was immolated yearly with solemn ceremony in the temple of each village. Not a drop of blood was spilled, and the body was burned; yet the natives maintained and believed that it was the same individual bird they sacrificed each year; more than this, that the same bird was slain by each of the villages."¹ Have we not here also a repetition of the phoenix legend of the East?

It would appear that among Aryan nations the cock was in some sense the successor of the phoenix, the representative of the sun-gods of Greece and Rome, and probably also, later, of Quetzalcoatl in Mexico, where we find it frequently represented on the monuments; but whether these are of early or late date, I must leave others to judge. Quetzalcoatl was undoubtedly an early god, adopted by later races into their mythology, as was Jupiter in Rome; and it is remarkable, that as the eagle was the messenger of Jupiter, so in Mexico it was the eagle which conveyed to Quetzalcoatl the mode of his father's death.

It seems natural that a bird should be chosen as the representative of aërial phenomena; but when we find it in many far distant countries, associated with the introduction of fire, we are tempted to the belief that in some manner these countries have received an ancient myth from some common source, and that that myth bore reference to the early discovery of fire, perhaps, as suggested in the Chinese legend, from sparks produced by the beak of a bird striking some very dry tree, and this bird may possibly have been one of the brilliantly-coloured wood-peckers, afterwards transformed by fancy into the gorgeous phoenix, and changed, according to the country to which the myth was borne, into the goose, the cardinal bird, the raven, the eagle, the robin, and various others, all, however varied in form, yet bearing

¹ Brinton's *Myths of the New World*.

about them some traces of the original phoenix in their relation to the sun, or sun-god with his lightning and dark thunderbolts, and always so accompanied by other myths and traces of a peculiar civilization of Turanian character, as to render it almost a certainty that at some remote period there must have been some admixture of the aborigines with Asiatic peoples of Turanian origin.

CHAPTER XII.

TRACES OF PRE-HISTORIC INTERCOURSE BETWEEN EAST AND WEST.¹

Legends corroborated by Monumental Evidence—Dr. Daniel Wilson's Routes of Migration—The Testimony of Canoes and other Boats— Implements and Utensils—Rock Sculptures of Peru—The Pottery of Peru and Hissarlik—The Symbol of the Protruding Tongue—The Winged Globe of Egypt in Yucatan and Palenque—The T and Swastika—The Mexican Pyramids, Dolmens and Rocking-stones—Cyclopean Architecture—Earth-mounds and Burial Customs—Monuments in Pacific Islands—Mr. Dall on Distribution of Masks and Labrets—Shell Ornaments.

HAVING pointed out in previous chapters the probability, from a similarity of legends and religious beliefs or superstitions, that an intercourse must have subsisted in very early pre-historic times between the eastern and western hemispheres, I will here endeavour to show from other sources, that such an intercourse is suggested not only by tradition, but by monumental evidence.

Dr. Daniel Wilson, in treating of this subject, points out three probable routes of migration from the eastern to the western hemisphere—1, through the Isles of the Pacific to South America; 2, an Atlantic Oceanic migration, *via* the Canaries, Madeira, and Azores, to the Antilles and Central America, and probably by the Cape Verdes to Brazil; and 3, *via* Behring's Strait and the North Pacific Islands to the Mexican Plateau. But he adds—"The more obvious traces rather indicate the same current which set from Southern Asia to the Pacific shores of South America, moving onward till it

¹ *Journal of Anthropological Institute*, February 1885.

overflowed by Behring's Strait and the Aleutian Isles, into the continent from whence it was originally derived."¹

It is obvious that as all these migrations necessitate a sea voyage of considerable length, they could only have been undertaken by peoples having some knowledge of the art of navigation; it is therefore desirable, in the first place, to ascertain how far the native vessels of the American continent support the theory of Professor Wilson.

Taking the very interesting and instructive paper of General Pitt-Rivers on *Early Modes of Navigation*² as our guide, we find on the American continent, first, the dug-out canoe, the earliest and simplest of all boats, the distribution of which is almost universal, and which probably played an important part in the very earliest migrations of the human race, enabling them to cross rivers and narrow seas; but we find that the Waraus of Guiana, and the Ahts of North America, fashion their canoes after the Burmese model, whilst the Fuegians, otherwise so low in the scale of civilization, sew planks together with thongs of raw hide, after the fashion of those in use in Africa and the Polynesian Islands. In California we see the papyrus float of Egypt; but the outrigger, so much used in the Pacific, does not appear to have found its way to America, although the *Buccina*, or shell trumpet, used on board the canoes of the Pacific, and known also in ancient Rome, is used in Peru.³ Rafts, like the Madras catamaran, were in use in Peru at the time of the conquest, and carried sails; one of these vessels having been met far out at sea, conveying both men and women, with provisions and articles of commerce, to the great astonishment of the

¹ *Pre-historic Man*, D. Wilson, p. 384.

² See *Early Modes of Navigation*, Colonel Lane Fox (General Pitt-Rivers) (*Journ. Anthropol. Inst.*, April 1875).

³ Mr. Walhouse says the chank shell bored is very generally used as a trumpet not only in India, but also in China and Japan to announce religious observances, and in India it is a distinguishing attribute of the god Vishnu, who holds it in one of his hands.

Spaniards, who had never before seen sails used on the American continent. From this slight sketch it will be seen that the art of navigation had made some advance on the American continent before the Spanish conquest, and that the forms of the vessels used can be traced to various parts of the world, although the absence of the outrigger, and the general absence of sails, would seem to show that whatever connection there might have been with Asia and the Polynesian Islands must have ceased before the invention of those two important improvements in primitive navigation.

Turning from navigation to the implements and utensils in use among the American nations before the conquest, we are again met by the fact that their congeners may be traced to many parts of the world. It would be impossible to point out all these, but I may note one or two weapons which, from their peculiar shape, have struck me as particularly useful by way of comparison. And first, an axe-head, probably of metal, which seems to have been regarded as sacred. This axe, called *champi*, with a handle more than a cubit in length, was given to princes on the occasion of their initiation into manhood, as a mark of honour. It is described in the Royal Commentaries thus—"The metal part had a blade on one side, and a sharp point on the other." This probably represents the *wedge* of gold said to have been carried by Manco Capac, and which sunk into the earth at Cuzco.

In the remarkable rock-sculptures in the Yonan Pass, Peru, engraved in Hutchinson's *Two Years in Peru*, we find a rudely-designed figure bearing this axe with a long handle, and having the head adorned with an axe-blade of a similar shape: this was probably an emblem of authority, for we find this same axe-blade attached to the helmet of the curious and unique figure portrayed on a vase found near Trujillo, Peru, which Bollaert looks upon as representing the god of war, and which certainly has a strong affinity with Hanuman, the monkey-god of India. Bollaert also points out the similarity between the vase bearing this figure and some

of those of Etruria, and further remarks that the flying insect resembles a figure on the Athenian vase of Electra at the tomb of Agamemnon.¹ To this I would add that there is a remarkable resemblance between the ornaments round the girdle of this figure, and those singular Chinese or Japanese ornaments, called *magatamas*, and would also call attention to the similarity existing between the Peruvian figure holding the long-handled axe and the sculptured figure of a man holding a similar axe at the entrance of a dolmen in Brittany. There are innumerable axes sculptured on the monuments of Brittany, but the axe-head is not of the same shape as the Peruvian, although in many it would appear to be similarly hafted.

This axe-head appears again as an ornament on the head of the Mexican god of hell, and it is also worthy of remark that the same squareness of face, and the pointed ornaments surrounding the faces, which apparently represent the sun-god in the Yonan Pass sculptures, and which appear so prominently in the figure on the great central gateway of Tiahuanaco, are seen in this Mexican figure.² I have not been able to trace this axe-head ornament in Egyptian, Greek, or Etruscan sculptures, although it appears to me that the ornament on the Greek helmets which holds the plume may have been derived from it; in fact, on some of the vases the form seems well defined. Two bronzes in the British Museum, labelled "Parts of Assyrian Helmets," are of precisely the Peruvian form, and it appears also on two horses among the Assyrian sculptures.³ It is seen also on some of the monuments from Halicarnassus now in the British Museum, and on the Hercules from the same place, and is figured by Wilkinson as forming an ornament on the Persian horses, whilst the axe from which this ornament seems to have been derived appears in India, and in the

¹ *Antiquities, &c. of South America*, Wm. Bollaert, F.R.G.S., p. 203.

² See *Smithsonian Contributions*, 1879-80.

The horses bearing this ornament are said to be foreign.

Hamath hieroglyphics. There is perhaps an approximation to the form in Egypt, and the Esquimaux have a copper implement of the same form.

Another axe, figured frequently in the Mexican paintings, bears a strong affinity to those still in use on the West Coast of Africa.

A still more curious weapon called the *mahuahuitl*, very frequent in the Mexican paintings, and which consists of several blades of obsidian inserted in a wooden handle, appears to be represented among the sculptures of Southern Peru; it somewhat resembles the Egyptian hieroglyph known as the emblem of stability, and its nearest affinities seem to be a wooden club in use in New Guinea, and the shark's-tooth sword or spear of the Philippines.

The strong resemblance between the pottery of Peru and that discovered by Dr. Schliemann at Hissarlik, cannot fail to strike every one, and has been very frequently remarked upon by antiquaries; but it is singular to find the figure which occurs so frequently on the Hissarlik vases appearing *reversed*, on vessels apparently sacred, in the Mexican paintings; whilst the Mexican form of the same symbol is found among the rock sculptures of Scotland, in conjunction with the T seen frequently in the hieroglyphs of Palenque. Nor is this the sole example of similarity between the symbolic sculpturings of America and Scotland. To say nothing of crosses and circles with and without centres, which are plentiful in almost every part of the world in which rock-sculptures are found, we may point out that the figure designated a *boar*, which is seen on the Scotch monuments, resembles much more nearly the American tapir, than the figure usually called an *elephant* resembles that animal. In both cases the design would appear to have been drawn from memory or description, and is therefore far inferior to the horse and the bull figured on the same monuments, both which animals must have been familiar to the workmen.

There is a figure occurring frequently among the Scottish and British sculptured stones which has been

designated the *incomplete circle*; it consists of a series of concentric rings with a dot in the centre, from which proceeds a line leading through and beyond the circles in various directions. This form is figured in Mr. Markham's translation of the *Royal Commentaries*, where it is thus described—"The army reached the town of Tumpampa, where the Inca ordered water to be brought from a river by boring through a mountain, and making the channel enter the city by curves in this way." Cup-markings, so common in Europe, are also to be found in Peru; but two still more remarkable similitudes must not be omitted before quitting this part of our subject.

Among the most hideous of American sculptures are the gigantic figures of Pensacola, represented with protruding tongue, and this symbol of the protruding tongue, generally accompanied by immense fangs, seems to range in ancient American sculptures from Mexico and Central America to Peru. Dr. Wilson gives a modern example of this symbol, the work of the Tawatin Indians, and it may be seen in a curious figure from a Peruvian vase. In Mexico this protruding tongue was a symbol of Quetzalcoatl. The same symbol appears on some of the early coins of Europe,¹ and is one of the characteristics of the god Bes in Egypt, and of the Gorgon of Etruria. Another still more curious resemblance between the sculpturings of the East and West is found in the winged globe so well known in Egyptian, Assyrian, and Persian sculptures. The American example of this mythological emblem is drawn in Stephens's *Central America and Yucatan*, having been found by him among the ruins of Ocosingo. These ruins are pyramidal structures, over the door of one of which appears this ornament in stucco. Stephens describes it thus—"The wings are reversed, there is a fragment of a circular ornament, which may have been intended for a globe, but there are no remains of serpents entwining it." On comparing the figure of this ornament from Stephens's book with the Egyptian

¹ As, for example, at Populonia and Parium in Mysia.

form, I believe no one will doubt that, notwithstanding the reversed position, the two are substantially the same. Nor do I think this is the only example of this very suggestive form, for in the elaborate paper by Mr. Holden in the *Smithsonian Contributions*, on "Studies in Central American Picture-writing," a view is given of the exterior of the Adoratorio at Palenque, and there, over the door, is a fragment of a stucco ornament strongly suggestive of a similar device. The reversal of the figure is worthy of remark, because it is found not only in America, for Mr. Park Harrison has observed the same in the Phoenician alphabet discovered in Sumatra.

I have already pointed out this peculiarity with regard to the ornament on the Mexican vases as compared with those of Hissarlik, and believe the same may be applied to some of the hieroglyphic figures on the rocks of the Yonan Pass, Peru, already noticed; these hieroglyphs strongly resemble letters, but according to the Phoenician alphabet, appear to be upside down. This, however, does not apply to one figure, which seems to be an ordinary Chinese letter. The most probable reason for this observed reversal of letters and figures appears to me to be that they have been engraved either from memory, or by workmen ignorant of their signification, who, receiving their pattern, applied it according to their own ideas, or by transfer.

Many more examples of the identity of the symbols employed in America and the eastern hemisphere might be adduced, as, for example, a curious form which might have been the origin of the *arms* of the Isle of Man, and which appears prominently in the rock-carvings of both hemispheres. Then there is the cross, both in its simple form and the more elaborated Maltese and *Swastika* patterns; the T also appears very frequently; but these have already been learnedly discussed by various ethnologists and antiquaries, and my object is rather to bring forward less known forms and facts. I also omit all reference to the serpent, in its apparently identical significance in the Old World and the New,

which subject I have already treated at some length in a previous chapter. But there is one figure which occurs very frequently among the Mexican paintings, of a bird with a female head, which so strongly resembles the harpy or siren of Greece and Rome that it must not be passed over in silence. Again, the *extended hand*, so prominent in the sculptures of Central America, and so common both in the rude rock-sculpturings and paintings of savages all over the world, appears in several forms identical with those of Mexico and Central America, in the Hamath hieroglyphics (which hieroglyphs seem to me to bear the strongest resemblance of any to those of Mexico and Palenque), and has in both hemispheres a symbolism, perhaps not wholly understood as yet, but which the researches of Mr. Garrick Mallery into the *Sign Language of the North American Indians* may help to unravel.

If we turn from forms and symbols to the great prehistoric monuments of the two hemispheres, we shall find a still more striking resemblance.

The likeness between the Pyramids of Mexico and those of Egypt and Assyria has frequently been pointed out, as also that between the great Serpent Mound of Ohio and our own Avebury; but that which is less generally recognized is the existence of stone circles and dolmens in Peru, with legends attached to the former entirely corresponding with those in Cornwall, where, as is well known, these stone circles are known as *dance maidens*, the legend being that they were heathen dancers turned into stone for disobedience to a Christian missionary, the name dance maidens being regarded by believers in the solar myth as a corruption from *Dawns maen*, significant of solar worship. The similar legend attaching to the Peruvian circles I give in the words of Salcamayhua, as translated by Mr. Markham. After giving a legend resembling that of St. Thomas, in which Tonapa crosses the lake on his outstretched mantle, he adds—"They say that the people of that town (Tiyahuanuca) were engaged in drinking and dancing when Tonapa came to preach to them, and

they did not listen to him. Then, out of pure anger, he denounced them in the language of the land ; and when he departed from that place all the people who were dancing were turned into stones, and they may be seen to this day."

I know of only one dolmen, described by Hutchinson,¹ but others doubtless exist, and it is not a little singular to find Quetzalcoatl in Mexico credited with the erection of a rocking-stone, like those attributed to the Druids in Cornwall. Bancroft says (vol. iii. page 254)—"Some say that Quetzalcoatl built certain subterranean houses called *mitlancalco*; and further, that he set up and balanced a great stone, so that one could move it with one's little finger, yet a multitude could not displace it."

In like manner the second of the Peruvian Incas is credited with having made his soldiers erect cairns or stone heaps called *usuns*; "every passer-by must bring a stone and throw it and their *coca* pellets on the heap as they passed."² Of the Cyclopean architecture of the Peruvians and builders of the gigantic ruins of Central America I have not space to write, but must point out their strong analogy with the remains of Egypt, the tombs of Mycenæ and Etruria, and also with some of the gigantic mounds of Ireland, especially with regard to the form of the doorways, and the method of forming the roof of overlapping stones. All these things, however, have been pointed out by many writers, the general conclusion arrived at being that these ruins are extremely ancient, and of indigenous origin in their several centres, notwithstanding the casual resemblance to Egyptian, European, and Asiatic art apparent in most of them.³

¹ *Two Years in Peru.*

² Markham: *Rites and Laws of the Incas*, p. 76.

³ Since writing this I have received *The Californian Architect and Building News*, containing an account of the Mexican Pyramids, in which the author puts forward an idea which, if it should be verified, would go far not only to connect these pyramids with those of Egypt, but also to give an approximate date for their construction. He says—"There is, however, this remarkable circumstance in the situation of the pyramids, that the line

But of all the monuments of pre-historic America, the great earth-mounds of Ohio and the Mississippi are perhaps the most remarkable ; gigantic earthworks representing various animal forms, circles, squares, and oblongs, designed apparently to serve some great mythological purpose, and to perpetuate some religious mystery. They have been divided into sepulchral mounds, sacrificial mounds, and mounds of observation ; but in any case they seem to have been constructed by a race of sun-worshippers, and to bear a decided analogy with the erections of the early sun and serpent-worshippers of the Old World. That the mound-builders came originally from a more southern latitude seems proved by the sculptures of animals not found in North America, and I would call especial attention to three mounds figured in the *Journal of the Anthropological Institute*, as seeming to bear particularly upon the religious systems both of Peru and Asia. In these three mounds we find an oblong figure between a greater and a lesser circle, representing, as I believe, the mundane egg between the sun and the moon, as hung in Peruvian temples, and in those of Egypt and Assyria. In Peru the mundane egg appears to have been signified by the plate of fine gold described by Salcamayhua as signifying "that there was a Creator of heaven and earth."¹

It is, however, when we come to burial customs that we are struck by the great variety in use on the American continent, and their identity with those in other parts of the world, extending even to those small details which would not seem likely to have arisen spontaneously in the minds of people wholly separated.

The use of burial masks, which prevailed so largely

joining the centres of both, follows within two degrees a true north and south line. The little discrepancy may be accounted for by the supposition that they were aligned by some star near the Pole at the time of their construction, probably Alpha Draconis, but not Polaris, as, erroneously, Almaraz says."

¹ Hutchinson describes a tomb in Peru constructed in the form of an egg cut through the centre. This is evidently connected with the myth of the mundane egg, and has its analogies in our own land.

on the American continent, as well as in Egypt, Greece, and Etruria, may be noticed as one of these peculiarities; another is the cording of the body, so as to keep it in that doubled-up position so universally adopted in very ancient times, and which is not only seen in Peruvian mummies, but is figured in Mexican paintings, and is still practised in Australia and in the Aleutian Islands, as well as among some tribes of North American Indians. Then there is tree-burial, also used in Australia, North Asia, and North America. But all these different modes of burial, and their several affinities, have been so elaborately and learnedly treated by Dr. H. C. Yarrow, in the volumes of the Smithsonian Institution, that I must refer my readers to those most instructive papers for details, and only notice two or three peculiarities which have especially struck me. And first I would call attention to a remark of Consul Hutchinson, in his *Two Years in Peru*, in which he notices the occurrence of a square opening at the base of some of the tombs. He says—"Amongst the ruins (of Parára) is one burial-place, 24 feet long and 18 feet wide, divided into three compartments cross-wise, with walls of 18 inches thick intervening. At the corner of each of these dividing walls, down at the base, there is a small aperture of about 8 inches square, the object of which it is impossible to guess at, unless it were intended to allow the spirits of the dead to hold communion with one another."¹ This opening, though usually of a round form, is found not only in America but also in India; and very frequently in dolmens in Great Britain, France, and I think in other parts of Europe; whilst the square form is found in Cyprus and Sardinia. It is connected, as I believe, with another singular custom also found to prevail in Peru, that is *trepanning*, several instances of which are recorded as having been found in graves in Peru, but the following extract would seem to extend the practice to the mounds of Illinois—"One of the skulls presented a circular opening about the size of a silver dime. This perforation had been made during

¹ *Two Years in Peru*, vol. ii. p. 49.

such-a-thus,c

life, for the edges had commenced to cicatrize."¹ There would also appear to be recorded one case of that incomplete trepanning noticed by Broca, in a skull found in Winnebago county, Wisconsin, which is thus described — "On its summit, an inch from the coronal suture, and $\frac{1}{8}$ inch to the left of the sagittal suture, is a remarkable circular depression, an inch in diameter. It shows no signs of fracture or violence, and the inside of the skull shows no corresponding elevation. What could have occasioned this thinning of the bone we cannot tell; we only know that it must have been done long before the death of its owner, for the wound, or whatever it is, is perfectly healed, and the bone in the depression is as smooth and of the same sort as the remainder of the skull."² This appears to correspond with that which was shown to me by the late Dr. Broca as an example of incomplete trepanning, which he looked upon in the light of a survival from the older form, in which the perforation was complete; the reason for the perforation in the skull, and the holes in the graves, being the same, that is to allow free exit to the spirit.³ The extension of this singular practice, found in skulls of *neolithic* age in Europe, to America, I consider to be a very important ethnological fact; and it is not a little noteworthy that, in one case at least, in Peru, the perforation is *square*, corresponding with the holes in the graves. In fact, the squareness of form which seems to prevail in America is a subject for inquiry, for it would appear to have a religious meaning, and would probably give a clue to the god to whom certain buildings were dedicated. In Europe, I believe, the square was sacred to gods of Hell, or the Under-World, but the same idea is not equally well defined in America, where the squareness appears to be extended to the sun-god, but the Peruvian figure may perhaps denote the moon.

¹ *Mortuary Customs*, Smithsonian Contributions, 1879-80, p. 118.

² *Report of Bureau of Ethnology*, Smithsonian Institute, 1879, p. 337.

³ For further particulars relating to this most interesting subject I must refer my readers to the following chapter.

Another curious fact revealed in the graves, especially of Peru, is the practice of distortion of the head in infancy. There is a legend relating to this given by Salcamayhua, to the effect that it was ordained by one of the Incas—"This Inca ordered the heads of infants to be pressed, that they might grow up foolish and without energy; for he thought that Indians with large round heads, being audacious in any enterprise, might also be disobedient."¹ This practice, however, was very common in pre-historic times among various European and Asiatic races, and may be traced in some of the South Sea Islands. One of the Hamath hieroglyphics might represent an ancient Peruvian or modern Aymara.

The painting of the face for mourning, which prevails still among modern American races, is also probably a survival from ancient times, and it is worthy of note that the covering of the face, particularly of women, with white clay, prevails not only in the Andaman Islands and Australia, but also among one tribe in California, where the paint used is formed from the ashes of the deceased husband, but generally the mourning colour in America is black. Another and very revolting burial custom of North America, that of scraping the flesh from the bones and placing it in a basket at the foot of the skeleton, which formerly prevailed among tribes of Virginia, the Carolinas and Florida,² may fairly be compared with the common Chinese ivory carving of a skeleton carrying his flesh sewed up in a basket; and another American custom, that of burning articles belonging to the deceased, in order that they may ascend to heaven in the smoke,³ is strictly analogous to the Chinese practice.⁴

These analogies between the customs ancient and modern of the eastern and western hemispheres might be indefinitely extended, for they meet the inquirer everywhere; but sufficient has been said to show that

¹ Markham's translation of *Fables and Rites of the Incas*, p. 76.

² The Yo-kai. See Yarrow's *Mortuary Customs*, Smithsonian Contributions, p. 194.

³ *Ibid.* p. 131.

⁴ *Ibid.* p. 100.

practices so identical and so widely extended must have had a common origin, for it appears to me impossible to imagine that *all* these things could have originated spontaneously in so many different centres. American anthropologists write generally in favour of the indigenous origin of American civilization, and the monuments are indeed sufficiently distinctive; but I would argue from the vast accumulation of facts, that either the ancient pre-historic civilized peoples of America must have conveyed *their* ideas and customs to the Old World in some mysterious manner, or they must have received the germs of these ideas and customs from the eastern hemisphere. The route of such possible pre-historic intercourse is generally assumed to have been from China, or perhaps India, by way of the Pacific Islands, and the great monuments before referred to as existing in many of these islands,¹ evidently the remains of a race prior to the present inhabitants, certainly favour this theory; but there are difficulties in the way which must not be overlooked. And first the absence from these islands of all remains of pottery and metal work, in both which arts the Peruvians and Mexicans (if not the Central Americans and the mound-builders) were expert, militates strongly against this opinion; but I do not think the environs of the great megalithic structures on these islands have been sufficiently explored to render

¹ On Kusai, or Strong Island, are found massive ruins, apparently fortifications, the stones being 8 and 10 feet long, some double that size, the stone unlike any found on the island, and neatly squared on six sides. On Ascension Island—Ponape—similar ruins are found, but larger. On the shore of one creek is a wall 300 feet long and 35 feet high, built of huge basaltic blocks, with gateway supported on enormous basaltic columns; a large square courtyard, enclosed by walls 30 feet high, with a raised terrace all round, and has evidently been divided into three parts, each containing a closed chamber 14 feet square. The outer walls are 21 feet thick at base, and 8 feet at the top, some of the stones being 25 feet × 8 feet. On Easter Island, besides the great images and crowns, are platforms 200 to 300 feet long, built of hewn stones, fitted without cement; and Captain Vine Hall found similar remains on Oparo or Rapaiti. See article, "Some Mysteries of the Pacific," in Cassell's *Family Magazine*, August 1890.

it certain that such articles are wholly absent, although unknown to the present inhabitants. It is, however, possible that some of the many customs and beliefs common to America and Asia may have been conveyed by the Pacific route, whilst the arts of metallurgy and pottery may have travelled across the Atlantic, giving rise to those numerous coincidences which are found to exist between the religious myths and rites of sepulture in pre-historic Europe, Africa, and America; nevertheless, it must not be forgotten that it is in *Peru*, on the *Pacific* coast, that the pottery, as well as the religion and architecture, bears the stronger resemblance to that of the older pre-historic empires of Egypt, Western Asia, Asia Minor, and Etruria, whilst in many other respects the affinity is great with China. Into this great and intricate problem I cannot now enter, but I believe that further investigations will eventually prove that in long bygone ages, as at the present day, there was a constant surging to and fro of peoples, sometimes by accidental migration, sometimes driven onward by enemies of a ruder race, yet always carrying with them from land to land fresh germs of thought, to be planted in new soil, to bring forth plants differing from those from which they originally sprang, although still bearing a family likeness to the parent stem.

I have not here touched upon those points of resemblance so ably discussed by Dr. Tylor, Sir John Lubbock, Dr. Wilson, and others, my object being solely to bring forward those minor details which have not excited so much attention, but which yet seem to me to add much to the weight of evidence proving a pre-historic connection between the two hemispheres. Of two or three of these I purpose treating in subsequent chapters, but would here add a few remarks by Mr. William Dall in his most interesting and instructive article upon "Masks, Labrets, and certain Aboriginal Customs, with an inquiry into the bearing of their Geographical Distribution," contributed to the *Third Annual Report of the Bureau of Ethnology* (Smithsonian Institution, Washington).

"There can be no doubt," says Mr. Dall, "that

America was populated in some way by people of an extremely low grade of culture at a period even geologically remote. There is no reason for supposing, however, that immigration ceased with these original people. Analogy would suggest that from time to time accessions were received from other regions, of people who had risen somewhat in the scale elsewhere, while the inchoate American population had been doing the same thing on their own ground. Be this as it may, we find certain remarkable customs or characteristics geographically spread north and south, along the western slope of the Continent, in a natural line of migration, with overflows eastward in convenient localities. These are not primitive customs, but things which appertain to a point considerably above the lowest scale of development in culture." Mr. Dall then goes on to speak of customs and myths, adding—"If these were of natural American growth, stages in development out of a uniform state of culture, it might fairly be expected that we should find them either sporadically distributed without order or relation, as between family and family, wherever a certain stage of culture had been reached, or distributed in certain families, wherever their branches were to be found. This we do not find.

"The only alternative which occurs to me is that these features have been impressed upon the American aboriginal world from without. If so, from whence?" Dismissing Northern Asia and Europe as giving no help in the matter, Mr. Dall turns to Polynesia and Melanesia, pointing out that from the last of the chain of islands stretching across the Pacific, it is but a step comparatively, swept by the northerly current, to the Peruvian coast. "We observe also that these islands lie south from the westerly south-equatorial current, in the slack water between it and an easterly current, and in a region of winds blowing towards the east." He then goes on to say, "The instances, &c. I have called attention to are particularly the use of masks and carvings to a more than ordinary degree, labretifery, human head preserving, identity of myths . . .

"In Melanesia we find carved figures of a peculiar sort used in religious rites, or with a religious significance, and strangely enough, two or more figures in a peculiar and unaccustomed attitude, especially devoted to these purposes.¹ Again, in Central America and Mexico we meet the same attitude, and again on the rattle in the hand of the shaman on the north-west coast, and in the carvings on his head-dress, and by his door."

He then goes on to point out a variety of customs and myths in the South Seas, similar to those in America, and, whilst deprecating any idea of a common origin, says—"But from my point of view, these influences have been impressed upon people already developed to a certain, not very low degree of culture.

"Of course this influence has not been exerted without contact. My own hypothesis is that it was an incursion from Melanesia, *vid* south-eastern Polynesia, which produced the impact, perhaps more than one. In all probability too, it occurred before either Melanesian, Polynesian, or American had acquired his present state of culture, or his present geographical distribution."

"The impulse communicated at one point might be ages in spreading, when it would probably be generally diffused in all directions; or more rapidly, when it would probably follow the lines of least resistance and most rapid intercommunication.

"The mathematical probability of such an interwoven chain of custom and belief being sporadic and fortuitous, is so nearly infinitesimal as to lay the burden of proof upon the upholders of the latter proposition . . .

"It has to me the appearance of an impulse communicated by the gradual incursion of a vigorous, masterful people upon a region already partly peopled

¹ The figures here referred to consist of a man holding a frog or lizard, the tongue of the reptile being attached to that of the man, as though the latter was receiving inspiration, or some special endowment from his totem ; and in addition to the places named by Mr. Dall, in which this peculiar figure is found, New Zealand may be cited, as it frequently appears in the elaborate wood-carvings of the Maories.

by weaker and receptive races, whose branches, away from the scene of progressive disturbance, remained unaffected by the characteristics resulting from the impact of the invader upon their relatives."

The contact suggested to Mr. Dall by the wood-carvings described, is further emphasized by the similarity of the tools and ornaments in shell, both ancient and modern, found in the South Sea Islands and America. In America, as in the South Seas, shell has been used from the earliest times, not only to make beads and ornaments, but also to supplement stone in the manufacture of implements, one especial shell being so much prized for this purpose as to have been carried for hundreds of miles inland, evidently forming a great article of commerce. Gorgets most elaborately carved have been found in some of the American mounds, and the design on some of these is almost identical with that painted on the great drums in use in Japanese temples, whilst the beads known as wampum, which formed both the money and historical records of the American Indians, are still made and used for similar purposes in many of the island groups of the Pacific.

CHAPTER XIII.

SURGERY AND SUPERSTITION IN NEOLITHIC TIMES.¹

Trephined Skulls in Peru and Illinois—Discovery of M. Prunières—Supposed Drinking-cup—Dr. Broca's Explanation—His Theories—Surgical Operation for Epilepsy—Posthumous Trephining to provide Amulets—Operation chiefly on Children—Performed by grating away the Substance with Flint Implement—Process described by Taxil (1603)—Incomplete Trephining—Object, to facilitate Escape of Evil Spirit—Amulets from Trephined Skulls—*Rondelles* found in Trephined Skulls—All French Trephined Skulls belong to Neolithic Times—None known in Britain—Extension to Mediæval Times—Still in use in Algeria and Polynesia—Algerian Mode resembles that of Ancient Peru—Belief in Efficacy of Operation—Victor Horseley's Theory—Dr. Robert Fletcher on Pre-historic Trephining.

I REFERRED in the previous chapter to the discovery of *trepanned* or *trephined* skulls in Peru, and also in Illinois, as well as of one in which the operation appears to have been incomplete, and I cited the late Dr. Broca as an authority on this most singular and interesting pre-historic surgical operation. It is indeed to Dr. Broca that we are indebted for a theory which appears to give a reasonable explanation of the origin of a custom so apparently barbarous, and the geographical distribution of which is of great ethnological and anthropological importance.

It would appear that in 1868 M. Prunières discovered in a fine dolmen which he explored near Aiguières, a human skull, from which a large portion had been removed, apparently by means of a flint saw. This hole M. Prunières looked upon as having been made in

¹ *Journal of Anthropological Institute*, May 1888.

order to transform the skull into a drinking-cup, according to a practice well known to have existed among semi-barbarous races ; whilst a polished portion of the hole he regarded as that part to which the lips had been applied in drinking.

Five other fragments of skulls, partially polished, were found in the same dolmen, and these were supposed to be fragments of other skulls prepared in like manner to serve as drinking-vessels. But in examining more nearly his collection of skulls from the caves or dolmens of La Lozère, which he had explored, and all of which were assigned to neolithic times, he found several mutilated in the same manner, although not all to the same extent, and he became convinced that the portions removed had been cut away to serve as amulets, several of which he afterwards found ; some carefully rounded, polished, and bored for suspension, and others remaining rough and shapeless as when cut from the skull ; whilst, singular to relate, some of these pieces were found *inside* the mutilated skulls, although evidently cut from other skulls.

Dr. Broca having been called upon to examine both the skulls and the amulets cut from them, discovered that the polished portion of the hole, which M. Prunières had at first supposed to have been the part to which the lips were applied in drinking, represented in reality an ancient cicatrized wound, healed many years before death, whilst, for some mysterious reason, most of the amulets bore traces of a portion of a similar cicatrix in some part of their circumference. Pondering upon the frequent recurrence of these curious facts, he came to the conclusion that it was the cicatrized wound which made both the skull and the amulets fashioned from it valuable, and set himself to discover the reason for this apparent veneration. His first conclusions were—

- (1) That during the neolithic period a surgical operation was practised, which consisted of making an opening in the skull for the treatment of certain internal maladies, and that this operation was performed almost, if not

quite, exclusively upon children. This he designates *trépanation chirurgicale*.

- (2) That the skulls of those individuals who survived this operation, were regarded as possessed of particular properties of a mystical order, and when such individuals died, rounds or fragments were often cut from the skull, to serve as amulets, and that these were cut by preference from the part adjoining the cicatrized opening. The latter operation he designates *trépanation posthume*.

I need not here give the arguments whereby Dr. Broca proves the correctness of his own theory, and refutes those who would assign these singular holes in the human skull to accident or disease, to a blow from a flint axe, or to the natural decay of the bone after death. On all these points Dr. Broca brings his great surgical and anatomical skill to the aid of his antiquarian researches, and proves conclusively that neither of the causes named could account for the appearances observed. Happily the posthumous mutilation was not carried out in all the trephined skulls, and consequently Dr. Broca has been able to show from the shape and condition of the cavity the manner in which it was formed. He believes that it was not made, as in the present day, by an instrument which would cleanly cut away the desired part at once; but that the perforation was laboriously made by scraping or grating away the substance of the skull, until the end was attained. This he ascertained, by experiment upon skulls in his possession, could be effected on the skull of a child in less than five minutes, whilst on an adult skull it would take an hour; this alone he considered sufficient to prove that the neolithic trephiners operated solely upon children, although, as he justly remarks, "even the longer period of torture is not beyond the endurance either of operator or patient in Oceania at the present day, for there can be no doubt that the power of endurance and of recuperation is far greater among savages than among civilized races."

But the proof that this painful operation was per-

formed during infancy or early childhood does not rest upon probability only, for Dr. Broca found among these perforated skulls one which from its peculiarity of growth (the coronal suture having been deflected by the wound) showed conclusively that the wound had been made and healed at an early period. One circumstance, however, seems rather difficult of explanation; it is that among all the trephined skulls hitherto discovered, there has not been one of a child found. Now, as it is certain that some, and probably a large proportion of those who underwent the operation, died from its effect, we should naturally expect to find at least a few children's skulls thus treated. Dr. Broca explained this by showing how much more readily the bones of infants decay, and how much more subject an imperfect and unhealed skull would be to natural disintegration than one perfectly sound, pointing out that even in ordinary interments children's skulls are rarely met with. There seems great plausibility in this explanation; nevertheless, it would certainly be more conclusively in favour of Dr. Broca's argument to find a child's skull thus treated.¹

Another curious point recorded by Dr. Broca is that, although these perforations are found in various parts of the skull, and the posthumous mutilations are often of great extent, the forehead is always carefully exempted in both cases; this he adduced as one proof among many that these holes were not wounds received in battle; and also as showing a desire not to interfere with the personal appearance either during life or after death, lest the deceased should not be recognized in the world of spirits.

Presuming that Dr. Broca has proved the existence, during neolithic times, of a practice of trephining consisting of scraping or grating away the substance of the skull with a flint or obsidian scraper, leaving a hole of considerable size; that this operation was generally performed upon young children; that those who sur-

¹ One has since been found in Bohemia, as noticed later, of a girl of twelve.

vived were looked upon with peculiar veneration, and that after death their skulls were sawn away from the cicatrized hole in order to provide amulets of peculiar value for the living, a portion of the cicatrized hole being carefully left upon the mutilated skull, whilst an amulet, cut from another skull, was frequently placed within the cavity made after death—the question naturally arises as to the reason of these singular practices.

Dr. Broca believes that this dangerous and painful operation was performed for the cure of epilepsy and convulsions, and he argues justly from the superstitious practices found in connection with it, that at that period, as well as long subsequently, these diseases were regarded as peculiarly the work of spirits, and that consequently neolithic peoples had attained to some conception of religion and of a future state. He shows that even as late as the seventeenth century, all convulsive diseases were regarded as epilepsy, especially in infancy, although true epilepsy seldom shows itself before the age of ten, and he thinks that this explains why the operation was so constantly practised upon young children, since the apparent cures effected by the process would be more numerous at that age, experience having proved that sufferers at a later age, that is true epileptics, were not cured thereby; whilst those who in early infancy were submitted to the operation, might grow up as living witnesses of its efficacy.

Dr. Broca quotes from a treatise upon epilepsy by Jehan Taxil published in 1603, not only to prove that at that date infantine convulsions were confounded with true epilepsy, but also as showing that up to that time epilepsy and kindred diseases were looked upon as spiritual diseases, the work of gods or demons, whilst the remedies recommended in this treatise are highly suggestive, consisting sometimes of the ashes of a human skull applied as a plaster on the crown of the head, sometimes the same administered in potions or pilules, and sometimes as nodules to be worn round the neck, whilst sometimes also *scraping* the skull was

recommended. Dr. Broca goes on to show that all through the middle ages, and even after the Renaissance, the substance of the human skull was used in the treatment of epilepsy, the skulls of Egyptian mummies being regarded as the most efficacious; whilst in the last century all the pharmacies contained a bottle labelled "Ossa Wormiana," for the treatment of epilepsy, the peculiar efficacy of the triangular lambdoidian bone consisting in its form, which resembles that of the amulets cut from the human skull; thus showing the step between prophylactic and mystic medicine.

Neither was the use of trephining as a remedy for convulsive disorders confined to neolithic times: it is still in favour with Oceanic races, with the Kabyles of Algeria, and also, it is said, with the mountaineers of Montenegro. Even in the last century a certain number of practitioners employed trephining as a cure for epilepsy, and Taxil, before quoted, writing in 1603, gives minute directions for the process, which in epileptic cases differed from that employed in cases of fracture of the skull, which is its sole use at the present day, especially when that fracture is likely to produce epileptic convulsions, all modern practitioners regarding it as useless in cases of spontaneous epilepsy. "But," says Dr. Broca, "how came it to be introduced into the practice of medicine? No one knows. Hippocrates, Galen, and other ancient authors, the Arabs and the Arabists, had not spoken of it; it was doubtless one of those popular practices which low empirics transmitted from one to another, and which sometimes got introduced into therapeutics." M. Prunières supposed that this practice of trephining was extended to idiots and insane, as well as to convulsive patients, and this Dr. Broca considers possible, although he believes its chief use was for infants suffering from convulsions, who were on that account supposed to be possessed by spirits.

Among the skulls examined by Dr. Broca was one which he regarded as particularly noteworthy, because from its appearance it would seem to have been *partially* trephined; a large surface had been scraped away, but

the operation was not completed, or at least it was not continued so as to produce the usual hole.

Dr. Broca possessed three specimens of this incomplete trephining; one from Roknia, in Algeria, one from Portugal, and another. This incomplete operation he supposed to have been employed either for a minor malady, or more probably that it was adopted by some unbelieving or less credulous individuals, who attributed the cure rather to the scraping of the substance of the skull, than to the hole made to facilitate the escape of the evil spirit of disease; but at the same time he regarded this incomplete operation as a sign of the decay of an old superstition, pointing out that in the comparatively late treatise of Taxil upon epilepsy, he recommends a treatment which consists of scraping the whole external table of the bone, but which was sometimes to be continued so as to expose the *dura mater*. "Hence," says Broca, "the empiric operators of the middle ages, whose barbarous practices are reflected in Taxil's book, did precisely that which had been done by neolithic operators many centuries before, with this difference, that with the former incomplete trephining was the rule, and complete the exception; whilst with the latter it was just the reverse, the complete operation being the rule, and the incomplete the exception."

I have before mentioned the amulets cut from the trephined skulls, some of which were found inside the skulls thus treated, although these invariably belonged to other skulls, and not to that within which they were found. These amulets are of various forms and sizes. A glance at the mutilated skull figured in Dr. Broca's book will show how they have been cut away from the hole made in trephining, and how much they must have differed in shape. Some of those found are carefully rounded and polished, and have a hole bored in the centre for suspension; some are triangular, some oblong, and some quite unpolished, just in the state in which they were cut from the skull; but in almost all there is a portion to be detected of the original cicatrized hole, and it is probably to this that they owed their value.

Dr. Broca thinks they were probably worn as a charm against those convulsive disorders for which trephining was practised, and that so great was their reputation that they became articles of commerce, so that it was necessary to preserve some visible token of their origin, in order to prove that they were really taken from a trephined skull. This, however, will not explain their presence within the skull from which others had been cut. Dr. Broca supposes that having gone as far as possible in robbing the deceased of his cranial substance, fear of his anger in a future state induced them to make some sort of restitution, by placing within the despoiled skull a valued amulet cut from another sufferer. I cannot say that this hypothesis is quite satisfactory, and I may perhaps be allowed to offer another, which has suggested itself to me as probable.

It would appear to me that the permanent hole in the skull, whether of child or adult, would necessitate some sort of shield for the exposed portion of the brain, the least injury to which would be fatal; and what more appropriate covering could be found than a portion of the skull of one who had suffered in like manner, and had lived and grown old notwithstanding, and to whose skull therefore a specially preservative power might be assigned by superstition? One might imagine a mother hastening to provide her suffering child with this preservative shield, either polished or unpolished according to her means, which worn by him in a fillet bound round the head during life, would, as well as other precious possessions, be buried with him. But when, perhaps, after a lapse of years the skull of the trephined was again mutilated to provide amulets or coverings for the living, this amulet would be displaced, and of course, being found too small for covering the enlarged cavity, it would naturally be placed inside, perhaps with the vague notion that the departed spirit finding the accustomed covering, would not miss the pieces taken from the skull, or would suppose the loss to be the result of accident or natural decay; for it is not without significance we read that the skulls wherein the amulets have

been found, and which are always posthumously mutilated, are filled up with earth so tightly packed into the cavity as to require some patience to remove it.

One point in favour of this hypothesis is, that two out of the three amulets hitherto found in the interior of the mutilated skulls, have been of the rare type styled *rondelles* by Dr. Broca; that is, they are nearly round, highly polished, and neatly fashioned at the edge; the third was also rounded and polished, although of a more irregular shape, had been broken; whilst the ordinary cranial amulets are irregular in form, and generally left in the state in which they were cut from the skull. We must also bear in mind that we are treating of a time when metal was unknown, so that if a shield was required for the exposed brain, some hard substance such as stone, shell, or bone must have been chosen, and this would add to the probability of cranial amulets having been so applied.¹ This, however, would account for very few, three only having hitherto been found within the cavity of trephined skulls, so that by far the larger number were doubtless used and worn as charms, probably to ward off or cure convulsive disorders.

Those who have followed this singular account of pre-historic surgery thus far, will naturally inquire whether the custom can be traced to its origin, and whether it was peculiar to one tribe and to one period. To both these questions Dr. Broca has given an answer, although necessarily an incomplete answer. He says that these pre-historic trephining were in use through the whole of the neolithic age, for they have been found in the cavern of the "Homme Mort" (Lozère), which dates from the commencement of the polished stone period; also in the sepulchral grottoes of Baye, which date probably from the latter part of that epoch, and again in certain dolmens of Lozère in which a few rare objects in bronze testify to the end of the neolithic age. Traces of the practice have also been

¹ In Otaheite they use cocoa-nut shell for this purpose, as recorded later.

found on skulls partially cremated ; and if it could be clearly demonstrated that cremation was never used in neolithic times, this would prove that the practice of trephining extended into the age of bronze ; but in the sepulchres from which these skulls were taken, no trace of metal was found, and the two modes of interment by inhumation and cremation were found to exist side by side.

On the other hand, one of three perforated skulls was discovered by M. Gassier at Entre-roches, near Angoulême, among relics which he assigned to the paleolithic period ; but Dr. Broca shows that from pottery and a polished hatchet having been found in the same sepulchre, as also bones of animals all belonging to existing species, this interment was certainly neolithic, and he does not think trephining can be traced to an earlier epoch than the neolithic. As regards its area and origin, he says the custom obtained in a large part of France, from the artificial grottoes of the department of Marne on the north, to the natural grotto of Sordes (Basses-Pyrénées) on the south ; the extreme stations to the south-east being those of Lozère discovered by Prunières. Similar discoveries have been made by various archæologists in the department of Charente on the west, in the great dolmen of Bougon (Deux Sèvres), and in two sepulchres near Moret (Seine-et-Oise). "Pre-historic trephining, therefore," says Dr. Broca, "was not a local practice confined to a single tribe ; it occupied an extensive area among people who without doubt were numerous and distinct, but who were certainly bound together by strict social and religious ties, and by a common civilization.¹ Whence came this curious practice ? If we judged according to the frequency of the facts, we should be disposed to believe that it originated in the region which now forms the department of Lozère, since it is there that the greater number of specimens have been found. But this result is probably due to the indefatigable

¹ These trephined skulls have since been found in many other parts of Europe, as will be seen later.

activity and the rare aptitude of M. Prunières, whose sagacious eye allows no detail to escape. It is not yet three years (1879) since the first discussion in the Anthropological Society of Paris drew the attention of French pre-historians to the subject; it is only since then that other neolithic stations have been studied with this especial object, and the already numerous facts gathered will doubtless soon be multiplied. It is no less probable that similar facts will soon show themselves beyond the geographical area indicated. I am not of the number of those who attribute to one people all the megalithic monuments, and all neolithic civilization; but it appears to me indisputable that this civilization has been spread most frequently by means of migration, and the determination of the places to which the practice of trephining has been extended may throw much light on the direction of these migrations.

"If the incomplete trephinings were as well known and as clearly demonstrated as the perfected; if, in other words, their witness was as decisive, the skull of Roknia described above would lead us to believe that the therapeutic surgery of the neolithic epoch had been imported into Northern Africa by the constructors of the dolmens of that region; perhaps we see there the origin of these trephinings, which have been in use from a very remote period among the Kabyles, and of which M. le Baron Larry has spoken before the Medical Academy of Paris. But a fact at present unique is not sufficient to establish such a conclusion."¹

There can be no doubt that neolithic monuments similar to those in which these trephined skulls have been found in France exist in large numbers in our own country, and more especially in Ireland, Wales, and the West of England; but as far as I am aware no record exists of the discovery of a skull thus treated in Great Britain or in Ireland; nevertheless I think it probable that such may yet be found; and indeed, some recently discovered by General Pitt-Rivers at Rushmore

¹ *Sur la Trépanation du Crâne, et les Amulettes Craniennes à l'époque Néolithique.* Par M. Paul Broca, 1879, pp. 69, 70.

may possibly belong to this category, and if so they would bring down the practice to a much more recent time than that suggested by Dr. Broca.¹

The subject doubtless bears strongly upon the religious beliefs of the people practising it. The hole bored in the skull had its origin in the belief in spiritual possession, which existed even within historic times in cases of epilepsy and other convulsive disorders. "The intervention of a supernatural agent," says Dr. Broca,² "appeared still more evident because certain individuals displayed in their convulsive movements a strength beyond their ordinary strength, nothing but a spirit imprisoned in the body could produce such effects; he is agitated and angry in his prison; if a door could be opened for him he would escape, and the sick would be healed. This probably gave birth to the idea of pre-historic trephining." This of course presupposes a belief in spirits, beings supernatural and intangible, yet requiring visible means of egress and ingress.

It may be regarded as almost certain that the holes found in the stones forming the entrance to dolmens in India as well as in our own country, have their origin in this belief, and the custom which has hardly died out, of passing children through such holes for the cure of certain diseases, appears to bear some analogy to the practice of trephining, although whether the custom of trephining originated in the holed stone, or whether the hole in

¹ I find a notice in *The Academy* (December 2, 1846) of the discovery in an ancient burial-ground at Selby, near York, of a skull with a small round hole in it, "evidently artificial, and resembling in every respect a perforation in the skull of a Roman lady discovered in one of the old cemeteries at York;" and the writer continues, "What was the object of these peculiar efforts of ancient surgery? It has been suggested that they might be intended to cure epilepsy." I do not know what has become of these skulls, nor whether their age has been ascertained, but if they were specimens of genuine trephining they would be valuable. In any case the discovery is curious and suggestive, as is also the report of the discovery in tombs in the same neighbourhood, of hazel twigs or rods in the hand of four out of seven skeletons found, which bears upon my previous chapter on Divination.

² *Sur la Trépanation du Crâne*, M. Paul Broca, pp. 69, 70.

the stone made for the passage of the spirit was taken from the surgical operation, is yet to be ascertained. I fancied I observed a survival of this curious custom of trephining during my sojourn in the South of France. At Cannes I saw several dogs with oblong patches of red leather stuck on their heads, and on inquiring of a man who had one of these dogs the meaning of this curious adornment, he replied, "You see, Madame, all young dogs are subject to fits, and it is supposed that this piece of leather worn just on the brain will prevent these attacks." "And does it really have that effect?" I asked, desirous of finding out how far the idea extended. "Ah, Madame," was the answer, with the inimitable French shrug of the shoulders, "how can I say? I am not a keeper of dogs, but *they say so*." I observed also in Milan that almost every dog wore on the top of the head under the compulsory muzzle, a little ornamental patch of cloth or leather, generally red, but whether with the same idea of warding off madness or fits I could not ascertain.

Dr. Broca has told us that even to the present day the shepherds of Lozère trepan giddy sheep, by taking the head of the sheep between their knees, applying the point of their large knife to the skull, and turning it between the hands until a hole is made, and he thinks this might have been done by a flint knife in neolithic times, although this process would not make a similar perforation to that in the trephined skulls; but the people of some of the South Sea Islands, who still practise trephining, perform the operation by scraping with a piece of glass, which—substituting flint for the glass—Dr. Broca thinks to have been the process in neolithic times, since he found by experiment that he could by that instrument, used as a scraper, make just the elliptic opening found upon the neolithic skulls. "The Kabyles of Algeria," says Dr. Broca, "who often practise trephining, use saws, by the aid of which they circumscribe the piece to be removed." Mr. Squier discovered in an ancient Peruvian tomb a skull which had been trephined by means of four sections, cut at

right angles, so as to take away a square piece. The Greek surgeons opened the skull by means of a turning instrument, called the *trepan*, but this, as Dr. Broca points out, could only have been after the discovery of metals, and yet the origin of the operation had been forgotten in the time of Hippocrates, in the fifth century before our era.

With regard to cranial amulets, Dr. Broca says that although those of which he has spoken are all of the neolithic period, yet there are traces of their use long after that time. "There is one in the Collection Morel, at Chalons-sur-Marne, suspended from a Gallic torque by a hole in the centre. A similar amulet pierced with holes was found by M. de Baye, also in the Department of Marne, and he possesses several others, which although not suspended to torques, were in all probability made to be hung round the neck like medals, and we may believe that this Gallic custom had descended from neolithic times, although perhaps the Gauls did not attach to them the same ideas as their predecessors; and that which had originally been an amulet, might in time have become simply an ornament, for we know how persistently certain popular customs become perpetuated under their material sign, even when the original design of the custom is lost."¹ But a singular illustration of the survival of the ancient belief in the efficacy of amulets cut from the human skull as a protection from epilepsy, may be found in the *English Illustrated Magazine* for May 1886, where, in an article entitled "In Umbria," we meet with the following passage.

"A very curious amulet (in Perugia) was the fragment of a human skull enclosed in a little brass reliquary, and considered to be a sovereign protection against epilepsy and kindred disorders. Tradition said that this bit of bone had belonged to the skull of a person dead two hundred years before, who had worked so many wonderful cures by his skill in medicine, and had lived such a long and saintly life, that he had been

¹ *Les Trépanations Préhistoriques*, Broca, p. 6.

loved and venerated by all. The professor told us that it was not at all uncommon, when a body was dug up in the course of excavations, to find a bit of the skull missing, and this amulet doubtless explained the use that had been made of such lost fragments."

It seems a pity that these mutilated skulls have not been scientifically examined, for the superficial account of the professor would seem to suggest evidence of trephining, although the date of the skulls referred to is not defined.

Among the relics of the Swiss lake-dwellers, Keller describes a tomb at Auvernier having a large slab of gneiss, in which is an opening more or less square, made with apparent intention, sufficiently large for a human body to be carried through, and among the relics within this tomb "a little bone 1½ inches in diameter, carefully polished on both sides, and perforated in the centre." This was probably a cranial amulet, and if so it would be extremely interesting as showing the extension of similar practices and religious beliefs to the lake-dwellers.

Many such relics might, I believe, be found among the neolithic tombs of Great Britain and Ireland, and the great light which would thus be thrown, not only upon the habits and customs, but also upon the superstitions, the belief in spirits and in a future state, by these mute records of an age and people long passed away, renders the search for them peculiarly interesting. In addition to this the ethnological value of these things must not be overlooked. It seems barely possible that the Kabyles of Africa, the natives of the South Sea Islands, and the neolithic peoples of France, would have hit upon this peculiar custom of trephining, and have carried it out in the same manner, and for the same cause, unless the custom acquired in one spot had been conveyed from that one spot to others, either as Dr. Broca says by means of migration, or by some mode of intercommunication at present unknown to us.

It will thus be seen that both the custom of trephining and the use of cranial amulets may be traced over a

very large area, including, as it would appear, the Pacific Islands and Peru, extending also probably to the North American continent, as well as to Africa and various parts of Europe; and also occupied a very considerable space of time, since we have traced both customs, either in full operation, or in a state of survival, from neolithic times to the seventeenth century, and even to the present day among the Kabyles and inhabitants of Polynesia. Nevertheless, there are some very curious points in connection with these customs, as explained by Dr. Broca, which require to be looked into more closely.

In the first place, all the trephined skulls hitherto discovered belong, as Dr. Broca believes, to the neolithic period, extending from the beginning to the end of that period, when they suddenly cease; and yet the belief in the efficacy of the operation in epileptic and convulsive disorders continued even to the seventeenth century, as is witnessed by the quotation from Taxil's treatise on epilepsy, wherein he recommends the treatment of epilepsy to consist of "the application of a cautery or issue, obtained by exposing the bone by grating and taking away the outer portion, *as they do generally.*" Why then do we not find skulls of the Iron age thus treated? Dr. Broca attributes the sudden cessation of trephining to a change of religion at the commencement of the Bronze age; he says—"The adoption of a new mode of sepulture necessarily implies a great change in religious ideas. But it is quite to be understood that a people is not converted at once, and entirely to new beliefs, and that superstitions would survive during some time. The practice of trephining, therefore, may well in certain places have survived the neolithic period for a short time, without our being justified in attributing it to the Bronze age, and everything leads to the belief that it became extinct at the same time as neolithic civilization."

Dr. Broca has, however, himself shown that there has been no such great change in religious belief in regard to trephining, for he has pointed out that in all ages epilepsy and convulsive disorders have been attributed

to spirits and demons, and that trephining was resorted to as a cure for these disorders as late as the seventeenth century, whilst exorcism to drive out the evil spirit, and that sort of survival which consisted in passing children through a holed stone for the cure of these disorders, may be traced even to the present day. Therefore that the custom of trephining should suddenly cease with neolithic times is strange *if proved*. The practice of cremation, which became almost universal in the Bronze age, may have destroyed in a great measure the necessary proofs, although Dr. Broca relates that among numerous fragments partially cremated, discovered by M. Chouquet, two bore traces of surgical and posthumous trephining, but from the absence of metal he puts this instance of cremation down to neolithic times. My own impression is, that the custom once introduced was continued both by tradition and practice to a late epoch, although perhaps it became less and less frequent, as superstition gradually died out among the better educated, and surgery became confined to an educated class, instead of being the privilege of witch doctors or medicine men, which was doubtless the case in neolithic times, as it still is in uncivilized countries.

Another singular circumstance with reference to these pre-historic trephinings is, that some of the skulls have been left entire, whilst others have been largely mutilated to provide cranial amulets. Dr. Broca thinks that the exemption from mutilation was due to the opposition of the survivors, but I would suggest whether it might not rather be that the unmutilated had not been cured, and that therefore their skulls were not regarded with the same veneration, or perhaps the posthumous mutilations may have taken place at a later date, in consequence of a new superstition, and the unmutilated may have remained undiscovered.

The conclusions of Dr. Broca have been challenged by Professor Victor Horsley, who in a paper read before the Anthropological Institute, in 1887, endeavoured to prove that the operation was employed in neolithic times, as in the present day, for the relief of

a fractured skull pressing upon the brain, and that the excision was made by sawing or by drilling a number of holes and then running them together by a saw, and so removing the piece of bone, rather than by the scraping process suggested by Broca. It is possible that both Professor Horsley and Broca may be right, but the learned French anthropologist, in his most interesting memoir on the subject, discusses Professor Horsley's views, and rejects them upon what appears to me sufficient grounds: these are the oval shape of the opening and the sloping sides of the cicatrized wound, both of which are consistent with the process of scraping, but not with the use of a circular trephine or a saw; then he rejects the idea of its use for injuries to the skull, because there is no appearance of fracture in the vicinity of the wound.

In the discussion which followed the reading of Professor Horsley's paper, most of the speakers inclined to the belief that the operation was probably performed for epilepsy or other convulsive disorders, and had a superstitious origin in accordance with Dr. Broca's views; and Dr. Ryle pointed out that in the works of Hippocrates, about 400 B.C., cases of trephining for injuries to the head are recorded, whilst Aretæus the Cappadocean, about the second century of our era, advises the use of the trephine for epilepsy—recommending scraping the bone down to the diploe for simple pain in the head, a practice suggestive of the incomplete trephining recognized by Broca. The cuts relied upon by Professor Horsley, as disproving Broca's theory of the process of scraping, had also been discussed by Broca, but he showed that these cuts appeared *only* in cases of posthumous trephining, none being known where cicatrization had taken place.

In an exceedingly interesting article on *Pre-historic Trephining and Cranial Amulets*, by Dr. Robert Fletcher, in the *Contributions to North American Ethnology*, 1882, the author, after discussing the views of Broca, comes to the conclusion that although the operation was performed by scraping in the case of children, it was

possibly carried out in adults by a series of punctures, as suggested by Professor Horsley, and he instances the practice still in use in Algeria, giving illustrations of the implements employed; but at the same time he points out that the discovery of many skulls partially trephined by scraping (at least twenty being known) is strongly corroborative of Broca's views, which are certainly borne out by the process still existing in Otaheite, where "a notion prevails that headache, neuralgia, vertigo, and other cerebral affections proceed from a crack in the head, or pressure of the skull on the brain. The remedy is to lay open the scalp with a cross or T incision, then scrape the cranium carefully and gently with a piece of glass, until a hole is made into the skull down to the *dura mater*, about the size of a crown piece." The portion of bone thus removed is supplied by a piece of cocoa-nut shell, carefully smoothed and inserted under the scalp over the wound, and this operation is so frequent that although nearly half die from the effects of it, yet very few male adults are without this hole in the cranium. The instrument formerly employed for this operation was a shark's tooth, but since the advent of Europeans glass has been substituted.

In Algeria the operation is frequently performed among a tribe of Kabyles, and has a religious significance, the operator being a priest, "who has inherited the right to perform it; the operator, the instruments, and the dressings are sacred, and the patient is held in reverence after his recovery. The dressings consist mainly of woman's milk and butter, both of which ingredients figure in ceremonial observances in the East."

M. Martin, who was sent by the French Government to inquire into the practice, mentions that he has seen men upon whom trephining had been performed five or six times, so that their heads were monstrously disfigured. The question has been raised by Dr. Fletcher which had also suggested itself to my mind, whether the priestly *tonsure* did not originate in the custom of trephining the head to expel the evil spirit of disease.

There would seem to be some reason for the supposition, especially when we remember the size and position of the tonsure in some orders, which certainly resembles the wound in the trephined skulls, and might be referred to a survival of a practice fallen into desuetude, being employed to denote the holiness of one from whom the evil spirit had been expelled. The singular and unexplained fact that the tonsure exists among the Brahmins would, in such a connection, lead us to suppose that trephining was also practised anciently in India; a supposition which receives support from the fact that holed dolmens—that is, stone graves with holes bored in one of the stones, as anthropologists believe, in order to facilitate the entrance and exit of the spirit—are found in India as well as in Europe and in Peru, and these holes in graves are certainly analogous to the holes made in the skull, in all probability for the same purpose, that is, to allow the escape of the spirit.

It is certain that among all barbarous peoples, disease in every form is looked upon as the work of malignant spirits; it is something outside of and foreign to the sufferer, brought about by some evil spirit in the service of an enemy, therefore the intruder must be expelled by a more powerful spirit, working in and through the witch doctor, who, being called in, proceeds to find out, by the aid of magic, who and what has caused the evil, pretending to suck out from the patient pieces of bone and stone as magically introduced by the evil spirit, who is exorcised with many mystic ceremonies.

It would be impossible to discover at what period in man's history a belief in spirits originated, but it was certainly very early. In fact, the fear of the unknown, which is the germ of religion, is shared with us by many of the inferior animals, and it is easy to see that this germ would rapidly develop in man into a superstitious fear of unseen spirits, so that when a sudden illness such as epilepsy or convulsions, for which no natural cause could be assigned, attacked any one, means must be found to get rid of the evil spirit who had brought it about, and the exit must be facilitated by making a

hole to allow of his escape. It seems natural to suppose that this or some similar train of thought must have been the origin of pre-historic trephining. The mind of uncivilized man is not strictly logical, and therefore there is to him nothing strange in the idea of making a tangible mode of exit for that which is intangible, and even to the present day a remnant of this superstition lingers among us, so that ignorant watchers round a death-bed will throw open the door or window to allow the soul to escape.

Among some races the soul, once departed, is forbidden to return, lest the deceased should appear as a wandering ghost, and with this idea all the natural vents in the body are securely closed, the mouth being tied together with strong cords. Perhaps some idea of this kind caused the packing with earth observed by Dr. Broca in the much-mutilated skulls posthumously trephined, and the placing therein the amulet worn in life to protect the exposed brain. Among other races free exit and entrance were provided for by cutting a hole in the tomb as well as a hole in the skull, but in both cases there is a distinct belief in spirits expressed in different ways.

Dr. Fletcher in his article on *Pre-historic Trephining*, referred to above, gives a list of trephined skulls found since the early discoveries in France; among these are several from Bohemia, one being of a girl of about twelve, one from Borreby in Denmark, and some in Russia. He also calls attention to the legend of the birth of Athene as related by Lucian, which he looks upon as the first historical record of trephining.

The principal and most important facts connected with this singular practice, may be thus summed up: That in pre-historic times, at a date not easily calculable, but which may certainly be reckoned by thousands of years, when men were living in caves, and in a state of society probably nearly resembling that of the South Sea Islanders of to-day, using only flint and bone implements, they had yet attained to such surgical skill as enabled them to trephine or cut away a portion of the

skull, in order, as was supposed, to expel an evil spirit which had caused epileptic convulsions ; that this operation was performed by scraping away the substance of the skull with a flint scraper, and that this operation was performed chiefly upon children ; yet so great was the recuperative power among these savages that they survived the operation many years, being consequently regarded with much veneration, and that after their death pieces of the skull including a portion of the cicatrized wound were cut away, to provide amulets to protect others from similar seizures ;—that this practice existed in many countries remote from each other, and extended even to America, and that it is still practised in Algeria and the South Sea Islands, and may be traced in a state of survival in other places ; and that in connection with it may always be found a superstitious belief in spirits requiring a visible means of ingress and egress, denoting a rudimentary belief in a future state.

CHAPTER XIV.

ON TATTOOING.¹

Tattooing very Ancient and almost Universal—In some Places Men and in others Women only Tattooed—Two Distinct Modes of Operation—I. By Cuts Cicatrized. II. By Pricks with Colouring Matter rubbed in—Cicatrization in Australia and Africa—Three Cuts on Cheek in West Africa—Same Mark on Ancient Bronze Head in Italy—Cicatrization in Andaman and Admiralty Islands and Timor Laut—Tattooing in New Zealand—Among the Nagas of India—In Borneo—In New Guinea—Among the Haidahs and Eskimo—Tattoo Marks on Chin of Women—Denotes Marriage—Tribal Marks—On Shell Masks—On Easter Island Statues—Implements of Tattooing—Tattooing in Japan.

nations
THERE is another painful operation still in very general use among savages and semi-civilized peoples, the geographical distribution of which seems to have an important bearing upon that intercourse between distant countries in pre-historic times, the existence of which I have endeavoured to prove from traditional and monumental evidence. I refer to the practice of tattooing, the origin of which seems lost in the night of ages, although its antiquity cannot, like that of trephining, be proved by existing remains.

Falling under the head of ornament, it seems probable that this painful mode of personal adornment was adopted at a very early period of human history, and was at one time almost universal, falling into desuetude with the advance of civilization when clothing became general, and ornaments were chosen which would not entail pain, and could be varied according

¹ *Journal of Anthropological Institute, May 1888.*

to the caprice of the wearer. But even to the present day tattooing forms the *dress* of the great mass of the unclothed natives in various parts of the world, whilst in some places it is more than a personal adornment, forming a ceremonial rite accompanying initiation into manhood. In some places men only are tattooed, in others women alone are thus adorned; but there is generally some story or legend given to account for the preference awarded to one sex over the other, as, for example, in Samoa, where Mr. Turner¹ tells us that Taema and Tilafainga, or Tila the *sportive*, were the goddesses of the tattooers. They swam from Fiji to introduce the craft to Samoa, and on leaving Fiji were commissioned to sing all the way, "Tattoo the women, but not the men." They got muddled over it in the long journey and arrived at Samoa singing, "Tattoo the *men*, and not the women"; and hence the universal exercise of the blackening art on the men, rather than the women.

There are two principal modes of tattooing. In the one which is probably the oldest, cuts are made in the flesh in such a manner as to leave a cicatrized mark, but generally without the addition of any colouring matter. In the other a pattern is drawn on the skin, which is afterwards pricked in with needles or other sharp-pointed implements, various colouring matters being rubbed into the wounds, so as to produce a permanent picture.

The first method prevails in Australia, where many of the natives are scarred in a remarkable manner, some of those exhibited in England a few years ago, having the shoulder cut and scarred, so as to resemble a great tassel, like a footman's shoulder-knot. But although the custom of thus gashing the shoulder, back, and breast seems in some parts of Australia to be almost universal, it does not appear to be connected with the elaborate initiation ceremonies; it may, however, probably have a tribal signification. This mode of tattooing by cuts, leaving raised cicatrices, which Mr. Tomkins

¹ Samoa, by George Turner, LL.D., p. 55.

suggests should be named *gashing*, prevails with modifications all over the African continent. On the West Coast, three cuts on each cheek would appear to be the chief decoration, and these cuts are coloured red and blue, according to the masks and other representations brought over for the Colonial and Indian Exhibition.¹ It is not a little singular that these three cuts appear on a bronze head of great antiquity from the Necropolis of Marzabotto, Bologna, Italy. This head is engraved in the *Smithsonian Report of the Bureau of Ethnology* for 1882-83, from which I have taken some of the material for this chapter. I cannot meet with any account of the origin of these three cuts, but believe they may perhaps have some religious as well as tribal significance, for Dr. Holub, speaking of similar cuts on the breast of a Koranna, says—"They have among themselves a kind of freemasonry. Some of them have on their chest three cuts. When they were asked what was the reason of it, they generally refused to answer; but after gaining their confidence they confessed that they belonged to something like a secret society, and they said, 'I can go through all the valleys inhabited by Korannas and Griquas, and wherever I go when I open my coat and show these three cuts I am sure to be well received.'"² Mr. Johnston gives a sketch of a Mu-ngala from the equator whose body was entirely

¹ Mr. Griffith in his paper on Sierra Leone (*Journ. Anthropol. Inst.*, February 1887, p. 309) says—"The girls are cut on their backs and loins in such a manner as to leave raised scars which project above the surface of the skin about one-eighth of an inch. They then receive Boondoo names, and after recovery from the painful operation, are released from Boondoo with great ceremony and gesticulation by some who personate Boondoo devils with hideous masks, &c. The girls are then publicly pronounced marriageable." Mr. Phillips explained after his paper, read at the Anthropological Institute on November 8th, 1887, the mode in which these gashes are made; he said a needle and a knife are employed, the needle being inserted under the skin, and gashes cut across it with the knife, sand being rubbed into the cuts to produce the raised appearance.

² "On the Central South African Tribes," *Anthrop. Journ.*, August 1881.

covered with cicatrizations, which he says are produced by raising lumps or wheals of skin by slitting it with a knife and rubbing some irritant into the incision, and he tells us that this mode of ornamentation is practised right along the course of the Congo up to the Stanley Falls. The marks thus made are tribal. "Thus," he says, "the Batéké are always distinguished by five or six striated lines across the cheek-bone, while the Bayansi scar their foreheads with a horizontal or vertical band."¹

The Andamanese, who also practise tattooing by means of gashing, do so, according to Mr. Man, first by way of ornament, and secondly to prove the courage of the individual operated upon, and his or her power of enduring pain. Women are the chief operators, and they now use a piece of glass to make the incisions, but formerly a flake of quartz. They commence tattooing children about their eighth year, and the process is not completed till they are sixteen or eighteen; but they never tattoo the face, neither do they rub any pigment or other preparation into the wounds. Although no particular ceremonies accompany the operation, the marks here, as in Africa, would appear to be tribal, for Mr. Man tells us of three tribes who may be specially distinguished by three rows of cuts down the back and chest, and "although women do the greater part of this work, the three lines down the back are almost exclusively made by some male friend with the ōla or pig-arrow; and except the three lines in front, the women of these tribes have no special marks, but are covered like the females of South Andaman with small raised cuts, which are inflicted by their own sex with the ordinary glass or quartz flake, and not with the pig-arrow."² In another tribe the central row of cuts down the back is omitted, and in another the whole body is covered with perpendicular and horizontal cuts.

In the Admiralty Islands, Mr. Moseley says that

¹ *The River Congo* (H. H. Johnston), p. 420.

² *Anthrop. Journ.*, February 1883, p. 334.

"the males are mostly marked with cicatrizations on the chest and shoulders," in the form of circular spots about the size of half-a-crown, which are often continued down the back in two lines meeting in the middle, and these marks appear to be assumed only at adult age, but "the women are all tattooed, with rings round the eyes and all over the face, and in diagonal lines over the upper part of the front of the body, the lines crossing each other so as to form a series of lozenge-shaped spaces." This tattooing is done with *short cuts*, probably with obsidian flakes, being coloured indigo blue, but it is scarcely visible at a distance, and does not form coloured patches as in the Fijian women and Samoan men.¹

The Solomon Islanders also tattoo in this manner with short cuts.

In Timor Laut, Mr. Forbes tells us, "both sexes tattoo a few simple devices, circles, stars, and pointed crosses, on the breast, on the brow, on the cheek, and on the wrists; and scar themselves on the arms and shoulders with red-hot stones in imitation of immense small-pox marks, in order to ward off that disease." But, he adds, "I have, however, seen no one variola-marked, nor can I learn of any epidemic of this disease among them."² It may therefore be interesting to compare these marks with those described above as in use in the Admiralty Islands, which they seem to resemble.

We turn now to the other species of tattooing, being that most commonly known by that name, in which a pattern is first drawn and afterwards pricked into the flesh, various colours, but chiefly indigo blue, being rubbed into the wounds, thus forming indelible marks. This mode of adornment is found very widely spread, but it reaches its culminating point in New Zealand, where it may be said to attain the position of a fine art, the tattooing for each part of the face being known

¹ H. N. Moseley 'On Admiralty Islands,' *Anthrop. Journ.*, May 1877.

² *Anthrop. Journ.* August 1883, p. 10.

by a separate term. The blue dye used by the Maories in tattooing is made from the soot obtained by burning the heart of certain trees.¹ The designs consist of curved lines, which frequently cover the entire face, even extending over the eyelids. The process is extremely painful, and can only be done by degrees, so that years are occupied in completing the operation, the instruments employed being of sharp human bone. Tattoo marks were looked upon as signs of dignity and denoted a warrior.²

The nearest approach to the New Zealand tattooing appears to be that practised among the Nagas of India, of whom Col. Woodthorpe writes, "they would be good-looking as a rule, but for the tattooing which in some cases make the faces almost black ; in others the tattooing is blue, and then the bare portion of the face, especially in those of fair complexion, appears pink by contrast. The tattooing on the face is called 'Ak,' and consists of four continuous lines carried across the forehead, round and underneath the eyes up to the nose, back over the cheeks, and round the corners of the mouth to the chin ; rows of spots follow the outside lines, and two fine lines mark out the nose, in a large diamond space."³ Some of the Naga tribes do not tattoo the face, but only the breast, shoulders, back, wrists, and thighs. The women are also tattooed more or less, but among the Angamis and other Eastern tribes, we find very elaborate designs, consisting of lines on the breast, from which proceed eight lines to the waist, gradually narrowing to a point; the thighs are covered with close vertical lines, with horizontal lines on the calves. This curious tattoo, which has the

¹ Mr. Kerry-Nicholls in *Anthrop. Journ.*, November 1885.

² It has been said, and probably with truth, that the tattooing of the bodies of chiefs and warriors was for purposes of identification, in case the head should be cut off by the enemy in battle, and this is particularly noticeable in New Zealand, where we are informed that every mark or line tattooed on the face of a chief is repeated on the body.

³ Colonel R. G. Woodthorpe, R.E., *Anthrop. Journ.*, February 1882, p. 208.

appearance of tight-fitting breeches, extends to Borneo ; and there is in the British Museum a painting from "*Head Hunters of Borneo*," representing a Tring priestess thus adorned. Of this curious ornament, Colonel Yule writes—"The practice of tattooing has been too generally diffused to build anything on its existence. But there is an application of it so peculiar and remarkable, that it is worth while to notice its coincident existence among races both of the continent and of the islands. This consists in covering the skin from the waist to the knee with dark embroidery ; in fact tattooing *breeches* upon the body. In spite of a thousand years at least, perhaps much more, of Indian religion and influence, every male Burman is thus adorned. In Borneo among certain tribes, the women have precisely the same decoration."¹

In New Guinea the Motu women are very elaborately tattooed in geometrical patterns. Some of the men are also tattooed, but in this case it denotes, as in New Zealand and among the Nagas, that they are warriors, and have slain one or more enemies ; and Mr. Lawes says, "It is no uncommon thing to hear men quarrelling, and one saying to the other, Who are you that you should talk ? Where are your tattoo marks ? Who have you killed, that you should speak to me ?" In New Guinea, the tattooing is done by marking out the pattern in lamp-black and then puncturing the skin by lightly tapping a thorn on it. Tattooing seems formerly to have been in almost general use among the Indians of North America, but is now almost confined to the Haidahs of Queen Charlotte Islands and Alaska ; it exists also among the Eskimo, and Greeley reports meeting a boat filled with Eskimo from the west of Davis Strait, one of whom was tattooed. The tattooing of the Haidahs differs from that of most other races, the patterns consisting chiefly, if not wholly, of animal forms instead of geometrical patterns ; these animal forms are the totems of the tribe, and are repeated on the pillars erected before the door of the chiefs, but they are con-

¹ *Anthrop. Journ.*, February 1880, p. 294.

ventionalized representations, bearing a strong family resemblance both to the carvings of ancient Mexico and Central America, and to those of New Zealand at the present day; a likeness which could not fail to strike those who compared them, as exhibited in the Colonial and Indian Exhibition: the chief difference being, that the Haidah totem posts were highly coloured, whilst those of New Zealand were of natural wood, polished. I referred to the peculiarities of these totem posts in a former chapter (XII.), and need not therefore say more on the subject now, excepting to draw attention to these resemblances as bearing upon a peculiarity connected with the art of tattooing. In the very fine portraits of Maories exhibited in the New Zealand Court of the Colonial and Indian Exhibition, the peculiarities of New Zealand tattooing were well depicted, and it might have been observed, that whilst the faces of the chiefs were covered with ornamental designs, the women were tattooed only on the chin, and the faces of young girls were not tattooed at all.¹ The tattooing of the chin and lips of women, we were informed, took place only after marriage, and in fact, like the wedding-ring among ourselves, denoted marriage. Now, this custom is not confined to New Zealand, but has a very wide range, and I quote a few instances from the article already alluded to on "Pictographs of the North American Indians" in the *Annual Report of the Bureau of*

¹ The custom, however, appears to vary, for I am informed that in some parts of New Zealand no importance is attached to tattooing, which is done, as with ourselves, simply as a fancy, some young girls being tattooed round the eyes. From the fact, however, that there is a special name in Maori for the tattooing of every part of the body, it would seem to have been originally ceremonial in origin. The female tattoos are for the breast, the thighs, and the chin, the latter being the principal. (See *Te Ika a Maori*, by Rev. Richard Taylor, p. 321, &c.) Mr. Taylor believes tattooing to have originated in consequence of the chieftains being of a lighter race and having to fight side by side with their black slaves, so in order to make themselves appear of the same race they blackened their faces, and when wars became very frequent they made these marks indelible to save the trouble of constant blackening.

Ethnology for 1882-83. "Captain John Smith (1819) says of the Virginia Indians—'They adorne themselves with copper beads and paintings. Their women have their legs, hands, breasts, and faces cunningly imbroidered with divers workes, as beasts, serpents, artificially wrought into their flesh with blacke spots.' " The Innuit, according to Cook, tattooed perpendicular lines upon the *chin of women*, and sometimes similar lines extending backwards from near the outer portions of the eyes. M. Gatschet reports that among the Klamath, the women have three lines, one from each corner of the mouth, and one down over the centre of the chin. The Modoc women tattoo three blue lines extending perpendicularly from the centre and corners of the lower lip to the chin. Stephen Power says, that the Karol California squaws tattoo, in blue, three narrow fern-leaves perpendicularly on the chin, one falling from each corner of the mouth and one in the middle. The same author says, "The squaws (Patáwat, California) tattoo in blue three narrow pinnate leaves perpendicularly on their chins," and the women of the Wintuns, another Californian tribe, tattoo three narrow lines, one falling from each corner of the mouth and one between. The *Report of the Pacific Railway Expedition*, vol. iii., says, "Blue marks tattooed upon a Mojave woman's chin denote that she is married." Bancroft says, of the Eskimo, that the females tattoo lines on their chins; the plebeian female of certain bands has one vertical line in the centre, and one parallel to it on either side. The higher classes mark two vertical lines from each corner of the mouth. The Kuskoquim women sew into their chin two parallel blue lines. On the Yukon River among the Kutchins the women tattoo the chin with a black pigment.¹ Nordenskiöld (*Voyage of the Vega*) says, the Chukché women are tattooed on the face, especially the chin, the men are not tattooed, but have sometimes a black or red cross painted on the cheek. The true Chukchés

¹ *Native Races*, vol. i. pp. 48 and 72.

are reported as living on the coast of America, north of Behring's Straits. They insert bones in the lips and in the sides of the mouth, and have articles of nephrite like that from High Asia.

Mr. Everard im Thurn speaks of the tribal tattoo mark at the corners of the mouths of the Indians of Guiana, but does not speak of these marks as confined to women: the women of that country, however, represented in the Colonial and Indian Exhibition, had distinctive marks on the lips and round the mouth extending across to the ear, but whether of paint or tattoo markings could not be certainly known.

Turning now to the eastern hemisphere, we find among the Ainos of Japan, that the women tattoo their chins, as it is said, to imitate the beards of the men, and among the fellahs of Egypt, and the labouring people of the cities, the women tattoo their chin, forehead, breast, hands, and feet. In Upper Egypt most women puncture their lips to give them a dark bluish tinge.¹ Among the Nagas of India we are told, "the women all tattoo slightly; fine lines are drawn on the chin, the outer ones being tattooed from the corners of the mouth."²

This tattooing of the chin appears also on the Motu woman of New Guinea depicted in the *Anthropological Journal* for May 1878.

Drawing together the threads offered by the foregoing facts, we may, I think, assume, that tattooing by *cicatrization* exists chiefly among the black races; that the marks are *tribal*, although in some cases they denote membership of a secret society, a sort of free-masonry, of great service to the possessor; that tattooing, as it exists in New Zealand and among the Pacific Islands, is chiefly ornamental, and in the men honourable, denoting bravery in battle; but the pattern employed has also a distinct reference to some event, as well as being tribal; whilst in the women, the tattoo

¹ See Featherman's *Social History of the Races of Mankind*, vol. v. p. 545; and *Science*, III. No. 50, p. 69.

² *Anthrop. Journ.*, February 1882.

mark on the chin almost always denotes marriage. So general does this custom of tattooing the chin in women seem, that it would appear possible by it to distinguish the sex not only in the living individual, but in paintings and sculptures. The wide distribution of this peculiar custom appears to me of considerable significance, especially as it follows so nearly in the line I have previously indicated as suggestive of a pre-historic intercourse between the two hemispheres. "If," says Max Müller, "we find the same words with the same meanings in Sanskrit, Persian, Armenian, Greek, Latin, Celtic, Slavonic, and Teutonic, what shall we say? Either the words must have been borrowed from one language by the other, or they must have belonged to an older language from which all these so-called Aryan languages were derived." This, using customs instead of languages, is what I have endeavoured to show in this volume. When we find in India, Japan, Egypt, New Guinea, New Zealand, Alaska, Greenland, and America, the custom of tattooing carried out in precisely the same manner and for the same ends, and when in addition to this we find a similarity in other ornaments, in weapons, in games, in modes of burial, and many other customs, we think it may fairly be assumed that they all derived these customs from a common source, or that at some unknown period, some intercourse existed of which these things are the surviving traces.

The antiquity of the art of tattooing is undoubtedly. Herodotus speaks of it as used by the Thracians, and I have always held that the Picts were probably tattooed, and perhaps the ancient Britains likewise, and that geometrical patterns and other markings similar to those in New Zealand and North America found on ancient stone monuments in Europe, probably denoted the tribal mark or totem of chieftains, as tattooed or painted upon their persons, but this of course, except from analogy, must remain a conjecture. Doubtless as at the present day, tattooing died out rapidly after contact with civilized races; but it is somewhat singular, that

no trace of tattooing, as far as I am aware,¹ is to be found among the Egyptian, Assyrian, Greek, and Roman paintings and sculptures, although these civilized nations must have come in contact with tattooed peoples, unless it had not at that period spread into the regions depicted by them. The bronze head before alluded to as found in the cemetery of Marzabotto, Bologna, is the only one I know in which tattoo marks, or rather the *African tribal cicatrices* on the face, are distinctly to be seen. Mr. Swan, who, in his article on the Haidahs, reproduces this bronze head, fancies he sees something like tattoo marks on one of the vases found by Dr. Schliemann; and I believe it can be plainly traced on some of the Peruvian vases. I pointed out in a note to my paper on "American Shell Work,"² the strong similarity between the tattoo marks of the Nagas as portrayed by Dr. Watt in the Colonial and Indian Exhibition, and those on the curious shell masks found in grave-mounds in America; and a still more remarkable coincidence in connection with this subject has since come to my notice. The shell masks of which I have spoken, have diagonal lines across the cheek, and some have a hole with a line or two lines proceeding from it, and sometimes two others crossing it, extending over what may be supposed to be the chin. Now it is a singular fact that exactly the same mark appears on the chin of the gigantic stone image from Easter Island now under the portico of the British Museum. Whether these marks represent tattooing, as affirmed by Mr. Dall, and whether then, as now, these markings on the chin denoted a female, must be left to further investigation; but it is a subject worthy, I believe, of the especial notice of travellers and antiquaries, for it appears to me of great anthropological interest. The implements employed are also deserving

¹ Since writing this I have found that in the picture at Thebes before referred to, of the time of Sethosis I., in which the four distinct human races are depicted, tattooing is observable on one-fourth of the figures. See "President's Address," *Journal of Anthropological Institute*, April 1870.

² *Journal of Anthropological Institute*, November 1886.

of notice, being in many places fragments of human bone, but of these I cannot treat at present.

Since writing the above, I have been favoured with a sight of a book recently published by Herr Joëst, on the subject, and if the Japanese tattooing represented in the plates is not supplemented by painting, it must be conceded that the Japanese are the most skilful tattooers in the world. The patterns resemble those on Japanese silks, and might readily be mistaken for a tight-fitting garment of that material. Such, indeed, seems to be the design, as it is only in use, we are told, among the lower orders, and takes with them the place of garments.

CHAPTER XV.

TRACES OF PRE-HISTORIC COMMERCE IN EUROPE.¹

Importance of the Subject of Pre-historic Commerce—Cups of Similar Pattern in Mycenæ, Corneto, and Cornwall—The Golden Armour of Mold—Lunulæ in Ireland and in Corneto—Buttons and Fibulæ—Were they Manufactured in Ireland, and of Irish Gold?—Identity of Various Articles in Ireland and Etruria—Irish Legends—Firbolgs and Leather Bags of Miners—Gold the Attraction to the Etruscans—Ingots of Gold in Irish Bogs—The Tumuli of New Grange and Dowth possibly Etruscan—Vallancy's Reference to Etruscan Games—Mr. Walhouse on Pre-historic Commerce with India—The Beryl—Barter—Jade and Amber—Mr. Boyd-Dawkins on Etruscan and Phœnician Trade-routes.

THE subject of commerce, as carried on in pre-historic times, is of interest alike to the anthropologist, the archæologist, and the student of folklore and legends; for, if the extent of that commerce and its routes could be well defined, much that is obscure in the unwritten history of mankind would become clear; since it is evident that variations in physical type, in language, in religion, in manners and customs, in legends and in the arts, would arise from a long-continued intercourse between barbarous and civilized, or semi-civilized races.

In the absence of written history, this intercourse can be traced only through legends, such as those recorded in the earlier part of this volume, or by the vestiges discovered in tombs, in the refuse-heaps known as kitchen-middens, or in the remains of long-buried cities destroyed by the hand of Time, by some sudden natural calamity, or by the inroads of enemies; and it

¹ *Journal of Anthropological Institute*, August 1884.

is a singular and significant fact that, in the majority of cases, the relics brought to light by the spade of the archæological explorer, confirm in a wonderful manner legends which have been handed down from time immemorial.

As an illustration of this, I have thought it might perhaps be of interest to call attention, in the first place, to three cups of gold discovered—one some years ago in Cornwall, another at Mycenæ by Dr. Schliemann, and the third in the Necropolis of old Tarquinii. The first, of which a full description is given in the *Archæological Journal* for September 1867, has been considered of sufficient importance to be figured in two of Dr. Evans's valuable works, that on *Ancient Stone Implements* and that on *Bronze Implements*. The prominence thus given to this particular find impressed it strongly upon my mind, and I was therefore especially interested in seeing a gold cup which, as far as memory serves, is almost identical with the Cornish example, in the Museum at Corneto, being one of the numerous and very important relics found in the Necropolis of the ancient Etruscan city of Tarquinii. I was particularly struck with the crumpled-up handle, which seemed to suggest an identity with that of the British cup, as having been made of very thin gold, bent or waved, so as to resemble a ribbon. The third cup, that discovered by Dr. Schliemann among the treasures of Mycenæ, although bearing a strong general resemblance to the other two, differs from them in shape, but all three are undoubtedly of the same type: they are all of a corrugated pattern, apparently produced by the same means, that is, by beating out a thin plate of gold over a carved model of wood, stone, or perhaps bronze, the handle being riveted on afterwards. A few other articles of a similar style, and almost of the same pattern, are known, one being an armlet of gold, found in Lincolnshire, and another, the splendid gold-corselet from Mold in Flintshire, now in the British Museum; but the pattern of the latter is much more elaborate, the plain ribs being alternated with bands of raised

balls, the effect of which is very fine; nevertheless, Mr. Franks, no mean authority, classes this corselet with the Cornish cup and the Lincolnshire armlet, and also with some other golden ornaments called lunulæ, some of which are found corrugated, although the majority are plain thin plates of gold, in the form of a crescent, hence their name; their use is somewhat uncertain, although they are commonly regarded as ornaments for the head, or gorgets. And amongst them I must not fail to notice one of great size and beauty, discovered in Ireland, which Keating says was "a chain, or collar, or breastplate, worn on the neck of the judge when on the bench, and which it was believed would close and choke him if he gave wrong judgment." This splendid specimen, figured in Vol. V. of the *Archæologia*, is not only corrugated, but ornamented round the edges somewhat after the fashion of the Mold corselet.

The great majority of these moon-shaped articles have been found in Ireland, fifteen of them being in the Museum of the Royal Irish Academy, whilst four have been found in Cornwall, two in Scotland, and some nearly resembling them are reported in French Bretagne and in Denmark. Of these, there was also one, and I think parts of others, in the case containing the cup, in the Museum of Tarquinia-Corneto, having been found in the Necropolis of Tarquinii, but whether with the cup I cannot say. There is yet another class of golden articles frequently made in a corrugated form, and abounding in Ireland, where they are supposed to have been worn as buttons or clasps to fasten the outer garment, although it is probable that they may have served as money, and these also, but of a small size, reappear at Tarquinia-Corneto. From their shape they were possibly either the origin of, or derived from, the fibulæ, which are so numerous in Etruscan and Roman tombs. These fibulæ were chiefly of bronze, and most of the articles to which I have referred above are assigned to the Bronze age.

It is certain that the corrugated pattern of the cups and of the Mold corselet is similar to that of numerous

bronze shields, chiefly Etruscan, whilst I must not omit to mention that the pattern of the Mold corselet is reproduced in a small but very elegant cap or diadem of gold, in the museum of the Royal Irish Academy. There are numerous other points of resemblance between articles found in ancient Etruria and Ireland, but at present I will content myself with mentioning one more only, namely, the bronze horns or trumpets, which visitors to the British Museum may compare, and will not fail to be struck with the strong similarity.

Mr. Blight has observed that "it is very remarkable that all the Cornish gold ornaments have their counterparts in Ireland;" but I venture to think that it is still more remarkable that Irish and Cornish pre-historic ornaments, whether in gold or bronze, should have their counterparts in Etruria and Greece: yet so it is, and I think it will be allowed that it is a matter of extreme interest and importance to trace out when and by what means the intercourse thus indicated took place.

It is the custom at the present day to assign certain forms of ornament and certain implements, whether of stone or of bronze, to stages of culture; to suppose that man, in his earliest stage, will naturally resort to a certain form of stone implement; and that consequently these things may have been invented independently in most, if not in all the various countries wherein they are found. That this may have been the case sometimes, and with the simplest tools and ornaments, I should be sorry to deny; but I believe, and have always held, that the more complex forms of weapons, and of ornaments—the advance in culture from the savage to the agriculturist, from the stone-user to the worker in metal—were the results of an intercourse carried on by means little known or understood, but which is indicated alike by language, by manners and customs, by variations of race-type, by traditions, and lastly, by relics widely distributed, yet evidently the work of the same people. No one will, I suppose, imagine that the three golden cups and the other articles I have mentioned, could have been independently designed in

Greece, in Etruria, in Cornwall, and in Ireland; therefore it becomes of great interest to ascertain how these things—and doubtless with them many others of a more perishable nature—were transferred from country to country. The greater abundance of some of the articles mentioned, in Ireland, would seem to indicate that they were manufactured in that country, and thence transferred to the other distant lands wherein they have been found; but it seems more probable that the pattern, having been derived from the shores of the Mediterranean, was afterwards reproduced by Irish goldsmiths from native metal. It is possible that an analysis might prove the source whence the gold composing these ornaments was derived, that of Ireland being exceptionally pure. That the workmen and the patterns came originally from the shores of the Mediterranean there can be little doubt. Dr. Schliemann, in describing the cup I have taken as an example, speaks of it as being of the well-known *furrowed* pattern of the Greeks, for which they had a definite name.

Mr. Gladstone thinks the ornaments found at Mycenæ may have had a foreign origin, and it is certain that some of them have their counterparts in Assyria; but ancient Greece collected her stores from many sources, and if some can be traced to Assyria, others were as clearly derived from Egypt.¹ Assyrian, Greek, and Egyptian influences are plainly perceptible in Etruria, but in all these countries it is evidently the *idea* which has been interchanged, to be worked out differently in each country, according to the genius of the people. It is similarity, rather than identity; but as regards the gold and bronze relics of Etruria and Ireland, there appears in many cases to be absolute identity: therefore it seems evident, either that the articles themselves

¹ Mr. Flinders Petrie's discoveries in Egypt prove that before the days of Abraham an extensive commerce was carried on between that country, Greece, and Phœnicia, for he has found in the same tomb, Greek, Phœnician, Cypriote, and Egyptian pottery, some of which he identifies with that found by Schliemann at Mycenæ, fixing the approximate date of manufacture at 1400 to 1200 B.C.

were conveyed from the one country to the other by commerce, or that the people of the two countries were the same.

The first is, of course, the proposition which will be most generally accepted; nevertheless there may be a certain amount of consideration accorded to the latter. Irish legends invariably bring the heroes of their history, and the founders of their nation, from Greece or some Mediterranean land, and a certain amount of truth is allowed to attach to these legends, although it is generally supposed that by "Greece" some nearer land is indicated, probably Spain. But if we read these legends by the light of archæology, it does not seem improbable that the Mediterranean may at least have contributed its quota to the various legendary migrations.

The late Sir William Wilde pointed out that traces of the three legendary races, the Firbolgs, whom he identifies with the Belgæ, the Tuatha de Dannans, and the Milesians, are still to be found in Ireland.¹ The colony of Partholan, said to have been destroyed by pestilence, and the Tuatha de Dannans, celebrated as necromancers, would seem to denote the more civilized Eastern nations, Phœnician or Etruscan.

The great battle of Moytura, fought between the Firbolgs and the Tuatha de Dannans, gave the latter the ascendancy; but in this battle both sides are said to have used metal weapons, and to have had Druid priests and enchantresses. The Firbolgs, being defeated, are said to have retired to Arran, in Galway Bay, and "there erected the most stupendous stone forts of cyclopean unmortared masonry that now remain in Europe, with walls eighteen feet thick, resembling those of Mycenæ."²

In reading these stories, and in seeing the very substantial proofs that the stories are not wholly mythical, we are tempted to believe that colonies, differing in

¹ *Tuatha* means Commander; *de*, Gods; *Dannan*, Art or Poetry, being the three tribes of this people (Warner).

² Sir W. Wilde, *Ireland, Past and Present*.

race, must have been planted in Ireland at various times, and that the Pelasgi, or whoever were the constructors of the cyclopean buildings, who preceded the Etruscans in Italy, must also have found their way to Ireland. The Firbolgs of the battle of Moytura, it must be observed, are no longer the rude Belgæ, described by Sir Wm. Wilde as found entombed with flint weapons and shell ornaments, but with no remains of metal, covered with huge stones and a mound of earth; they have attained to the knowledge of metal weapons, have chiefs or kings, a settled government, and a religion described as Druidical, and apparently similar to that of their opponents, the Tuatha de Dannans.

This change we can only suppose to have been caused by foreign influence, and for this foreign influence we must look to countries already acquainted with the use of metal, and practising that mode of architecture, and those religious rites, which they would seem to have introduced among the Firbolgs, whose name Warner translates as "*creeping or cave men*," although Keating gives a legend that they were the descendants of the first Greek colonists, who had returned to Greece, been made slaves of there, and afterwards seized Greek ships and returned to Ireland, and he derives the term Firbolg from *Fir*, signifying *men*, and *Bolg*, a *bag*, from the leathern bags they had been compelled to wear, to carry clay dug from pits to the top of hills, to make a soil upon the rocks for cultivation.¹

I do not know what traces of the terraced cultivation, so much in use in Southern Europe, are to be found in Ireland, but the leathern bag may have another signification, for in the very interesting account given by Gmelin, Lepechin, and Pallas, of the mines worked on the south-east borders of the Ural mountains, presumably by the Arimaspi, prior to the conquest of the country by the Tatars, and before any knowledge of iron, we are told—"Besides some implements, the use of which is unknown, there were wedges and

¹ Keating's *History of Ireland*.

hammers all of copper that had been smelted, but without any particle of gold in them. Instead of sledges they seemed to have used large stones of a long shape, on which are to be seen marks which show that handles had been fastened to them. They seem to have scraped out the gold with the fangs of boars, and collected it in leather bags or pockets, some of which have been found."¹ Now, as there seems to be no doubt that it was the search for metal—whether gold, tin, or copper—which tempted foreigners to our shores in the remote times of which we are speaking, and as it is well known that gold was found in Ireland in considerable quantities, we seem to see in these Firbolgs, with their leather bags, a colony of miners from Asia or from Greece, establishing themselves where they found the precious metal, making themselves kings or chiefs over the barbarous natives, instructing them in the arts, especially of metallurgy, and giving to them their own name (Firbolgs). That gold was an article of commerce in very early times in Ireland is proved by numerous discoveries of ingots, as well as of manufactured articles, in bogs, and in excavations for railways, &c. Vol. III. of the *Archæologia* gives a long list of discoveries of gold in Irish bogs, amongst the articles being several ingots, some of which are described as of the form of "heaters for smoothing," three of them weighing seven pounds and a half; whilst the innumerable manufactured articles prove that it was not only miners and merchants who thus established themselves, but also artificers of no mean skill.

The question arises whether these artificers were the Firbolgs, or that later race, designated as Tuatha de Dannans, whom I have ventured to regard as Etruscans?

Returning to the three cups and other articles of gold with which I commenced this chapter, I may point out that Dr. Evans compares the Cornish cup with one of amber found near Brighton, and with another of Kimmeridge shale found at Broad Down near Honiton, the

¹ Jacobs' *Historical Enquiry into the Production and Consumption of the Precious Metals.*

latter being very similar in shape ; but if we go thus far for analogies, we may perhaps be allowed still further scope, and refer to sculptured monuments in Tartary, upon which a figure appears holding a cup of a very similar shape, and also, if the engravings are to be trusted, of the same corrugated pattern, as though it were an object of veneration, or of some especial significance. It may possibly have been a golden cup similar to these, of which we are told that Darius the Great, having one only, valued it so highly that he placed it every night under his pillow.

We thus seem to be able to trace cups of this particular pattern from Tartary to Greece, Etruria, and Great Britain, and may ask whether they were manufactured originally in Tartary, possibly by the Arimaspi, of whom so many fables have been related, carried by their owners from place to place, perhaps for purposes of divination, and at last buried with them as their most precious possession.

If the Firbolgs were Scythians, and acquainted with metallurgic arts, it is of course possible that articles of this especial furrowed pattern might have been manufactured by them in Ireland, and thence dispersed ; but if the Firbolgs are in any way to be identified with the rude miners of the Ural mountains, a description of whose implements I have given, they would not seem to have been capable of the delicate work exhibited in the cups, the lunulæ, the Irish diadem, the Mold corselet, the Lincolnshire armlet, and other articles ; and we must therefore suppose these to belong to a later period, and to have been introduced by a second Scythic wave, or by another people. Seeing the strong resemblance between these articles and those to be found in the museum of Corneto-Tarquinia, and remembering how famous the Etruscans were for their bronzes and gold work, I prefer to think that these articles were introduced by the Etruscans, either directly or indirectly ; that they had obtained the pattern—at least of the cups—through Greece, the latter country having received it perhaps from Persia, and originally from Scythia.

With the Cornish cup were deposited articles of ivory, glass beads, pottery of a reddish-brown colour, and a bronze spear-head, with other fragments of metal, all consistent with that Etruscan ownership or origin which I have ventured to assign to it. "The Etruscans, masters of the sea," says Dr. Birch, "imported enamelled ware from Egypt, glass from Phœnicia, shells from the Red Sea, and tin from the coasts of Spain or Britain." Whether this trade was carried on wholly by sea, or whether a trade-route existed at this remote period across Europe, cannot be very easily decided, but it seems to me that it would not be impossible to trace these early merchants by their wares, through the Swiss lake villages and Gaul to our own shores, and across Cornwall and Wales to Ireland, in which island there would seem to have been a more permanent settlement made. Nevertheless, it is easy to see that a coasting voyage round Spain, destined for Britain, might be driven more than once by storm or contrary winds to Ireland, which, once discovered, and found to possess metals of various kinds, would certainly be revisited, and probably made a dépôt for commerce, or a settlement for mining purposes.

Indications that one at least of the races thus visiting Ireland was Etruscan may, if I mistake not, be found, not only in the articles of bronze and gold I have described, but also in traditions and in the pages of history.

Cæsar's assertion that the gods of the Gauls and Britons were the same as those of Rome; that the Druids made use of Greek characters, although apparently ignorant of the Greek language;¹ the great influence possessed by women, especially in Ireland, where I believe the genealogies were traced in the female line as in Etruria; the extraordinary powers of divination ascribed to the Druids and to the Tuatha de Dannans, seem to stamp them as of Etruscan race, or at least as having derived their traditions, as well as their gold and bronze implements, and perhaps their mode of sepulture, from Etruria. The great tumuli of New

¹ *Cæsar*, Book VI., p. 17; V. p. 48; I. p. 25.

Grange, Dowth, &c., were, unfortunately, rifled by the Danes, but the markings upon the stones might fairly be looked upon as Etruscan, and there is every reason to suppose that the arrangement of the tombs, and the treasures they contained, were such as might still be found in those great tumuli, which evidently preceded the underground painted tombs in the Necropolis of old Tarquinii, if only some competent archæologist would devote to them the attention which has been given to our own great tumuli; and if that diligent and scientific research could be extended to the desolate site of the city of Tarquinii, I feel assured that many discoveries of infinite value to archæology and anthropology would reward the explorers.

I have dwelt in this chapter chiefly on the evidences of pre-historic commerce between Mediterranean peoples and our own islands, as afforded by gold and bronze articles, but the subject might be indefinitely enlarged, and I trust some one fully conversant with the subject will take the matter up, and assign to each race its proper share in spreading civilization by means of commerce from East to West. I have treated more particularly of the Etruscans, because there seems a tendency to ignore all pre-historic commerce except as carried on through the Phœnicians, whereas it appears to me that Etruscan influences are far more evident than Phœnician, for I do not think that any of the articles I have mentioned as discovered alike in Ireland and in the Necropolis of old Tarquinii have been found among undoubted Phœnician remains, although there are doubtless others which may be referred to that source, and some which may also be traced to Greece and to Egypt. I feel convinced that a careful study of pre-historic commerce, as revealed by relics such as those I have indicated, when undertaken by competent workers, will eventually throw a flood of light upon the anthropology and archæology of Great Britain and Ireland.

In pointing out the connection existing in the Bronze age between Etruria and Ireland I am not bringing forward a new theory; General Vallancy many years

ago gave as one indication of this intercourse, the fact that the survival of one form of divination, existing in a game played with five small stones, is called in Ireland *clocha tag*, or 'tag' stones, from Tages, the prince of Etruscan diviners; but that to which I wish particularly to call attention is, that this connection appears to be made much clearer by recent discoveries in the course of the explorations in the Necropolis of old Tarquinii, which I think in the interests of science should be carefully watched, noted, and *extended*; for the discoveries made there since 1878 seem to supply one of the missing links in the chain of evidence connecting East and West in pre-historic times.

It may be of interest in connection with this subject to note that some years since a gentleman dug up, on the Goodrington Sands, Paignton, two vases of *tin*, pronounced by the authorities to be Roman, but which may perhaps turn out to be of earlier date.

Mr. Walhouse has pointed out the extension of this pre-historic commerce to India as testified by the use in classic times of the "Olibanum," probably the produce of India, and identical with the perfumes still used in Hindu temples, and also by the finding in European cabinets of engraved gems of aquamarine. He says—"The beautiful variety of beryl, known as aquamarine, 'of the colour of pure sea-water, and found only in India,' as Pliny remarks, was well known in antiquity, and several engraved gems of it, of the best classic period, exist in European cabinets; now aquamarine stones of that particular colour have only been found at one particular spot in Southern India, about 140 miles from Calicut, on the Malabar coast, a port much frequented in the ancient traffic between the Red Sea and India, and it is noteworthy that deposits of Roman urns have several times been found in the neighbourhood of the aquamarine mine, which may not unreasonably be regarded as vestiges of ancient communication and traffic.

There can be no doubt that commerce began in the very earliest stage of man's life-history, for archæological

discoveries prove that even in paleolithic times there existed workshops for the manufacture of flint implements, and these doubtless were bartered by their makers for other useful articles. Everything goes to prove that primitive man was by no means deficient in commercial instincts; he wandered far afield to collect objects which possessed for him what to us would be called a money-value, and hoarded teeth and shells, and formed the latter into beads, probably for the purposes of exchange.

There is another article of commerce which appears to have passed from hand to hand in neolithic times by way of barter, and to have been very highly valued; this is jade, the presence of which in European graves has been held to prove commercial intercourse with Asia. The origin of these jade articles is still in dispute, as it has been found, I believe, in the Caucasus, and it is possible that the pre-historic workers may have brought it from its nearest source, and as boulders of jade have been recently discovered in America, an indigenous origin may be surmised for the jade found in American burial-mounds; but the question is still *sub judice*.

This, however, can hardly be said of amber, which from the very earliest times was eagerly sought as an article of commerce. The sources of this are pretty clearly defined, and from the colour and quality of the material the locality of its origin may be fairly determined; thus Mr. Franks, of the British Museum, says that the dark red variety found in Greek and Etruscan tombs came probably from Sicily. Red amber is also found in Spain and Italy; but the great source of the amber used in pre-historic times was, as at present, the shores of the Baltic. Mr. Boyd-Dawkins, in his *Early Man in Britain*, gives a map of the trade-routes followed by the Etruscans in their search for this highly-valued substance. 1. By the valley of the Adige past Verona and Trent, over the Brenner Pass into the valley of the Inn, crossing the Danube at Linz or Passau, and thence over the Bohemian mountains into the

valley of the Elbe, and thence to the amber coast of Schleswig and Holstein. 2. By Trieste, through Lai-bach, Gratz, and Bruch, thence to Presburg, past Breslau to the lower Vistula to Elbing. These trade routes were also followed later by the Romans.¹

Hallstadt, which has become famous from the discoveries recently made there, occupied a most important position on route 1, and from it trade in salt and metal was carried on. By this route, going still farther north, Etruscan articles and patterns found their way into Britain, and the golden armour at Mold previously mentioned is of the same pattern as metal-work found at Hallstadt, Veii, Corneto, and Præneste. Etruscan weapons and designs are also found in Denmark; and Mr. Boyd-Dawkins traces yet another trade-route through Switzerland, into the valley of the Rhine, and through various Alpine passes; also by the Mediterranean into France; these routes being everywhere marked by ornaments and weapons of Etruscan derivation, by safety-pin brooches, and by other well-known Etruscan work.

The Phœnicians, so well known as traders, may be traced through Palestine eastward as far as the Eu-phrates and Tigris, by the metal bowls with Phœnician inscriptions found in Babylonia. They are mentioned in Egyptian records as importing vases, rings, rhytons, necklaces, precious stones, and ivory as presents to Thotmes III. Their glass, amber, and metal-work were famous among the Greeks, and they are known to have founded Cadiz not later than 1100 B.C.

These are a few of the traces of a commerce known to have existed in the Bronze and early Iron ages; but the traces of a still earlier and wider commercial intercourse, extending even across the ocean to America, may, as I believe, be yet demonstrated by means of the spade of the skilful explorer.

¹ *Early Man in Britain.* Boyd-Dawkins.

CHAPTER XVI.

PRIMITIVE INSTRUMENTS OF MUSIC.

Music Universal—Ancient Myth of Music of the Spheres—Instruments of Percussion—The Drum—Wooden Harmonicons—Wide Distribution—The Rock Band—Chinese Harmonicons—The Drum in Religious Ceremonies—The Rattle—Drums and Rattle combined—The Timbrel—Bells—Legends relating to Scottish Bells—Belief in Music for expelling Disease—Antiquity of Cymbals—Bells and Gongs in China—The Bell of St. Patrick—Bells as Instruments of Vengeance—The Baptism of Bells—Reversion in Musical Instruments—Jubal.

IN Chapter VI. of the present volume I gave a short description of the art of sculpture as practised by primitive man, but there is another art, that of music, which may be said to be universal, and which is certainly traceable to the earliest stage of human progress, for the possessors of vocal chords would not be long in putting them to use, and the imitation of natural sounds would result in the birth of vocal music. But the manufacture and use of instruments of music would require more thought, and we should not therefore expect to find them at a very early date; nevertheless, musical instruments of the flute kind have been found among relics of paleolithic times, both in Europe and America; and as the flute does not represent the earliest stage of the art, we may suppose that instruments of a ruder type were known even earlier. The music of savages is discord to the ear of civilized Europeans, whilst our music is certainly as little appreciated by them and by civilized Asiatics, as theirs is by us.

During the Colonial and Indian Exhibition we had an opportunity of judging of Eastern music and musical instruments, and we have also had among us Japanese, Siamese, Cingalese, and Arabian musicians, as well as South African natives, with the most singular and primitive of musical instruments, from which they succeeded in drawing sounds which they regarded as music; and it may be safely asserted that there is no savage tribe, however low in the scale of civilization, which does not possess one or more musical instruments, although some are of extreme simplicity, the most simple of all being that of the Australians, for at their native corroborees, or dances, the women squat round in a circle, and stretching their skin cloaks tightly over their knees, make use of them as drums, beating time and humming to the dancers.

The ancients poetically imagined a music of the spheres, a grand and solemn diapason swelling through all space, to which the worlds, animated by the breath of the Almighty, sang in harmonious chorus as they danced in graceful measures around the throne of God. They believed literally that "The morning stars sang together," and we, although no longer believing in the actual music of the spheres, yet talk of the harmony of creation, and conceive of the order pervading the universe as of a grand musical chord, where each note has its own proper place and significance, lacking one of which the chord would be imperfect; or displacing one, discord would ensue. Pythagoras (B.C. 560) is regarded as the originator of the belief in the music of the spheres, and he taught that the spaces between the planets corresponded with the several musical tones. Ptolemy, Macrobius, and Porphyry were his disciples, and according to old Thomas Stanley their doctrine was that "the names of all sounds were derived from the seven planets which move circularly in the heavens, and compass the earth. The circumagitation of these bodies must of necessity cause a sound, for air being struck, from the intervention of the blow, sends forth a noise, Nature herself constraining that the violent collision of two

bodies should end in sound, and the curious reason assigned to account for our insensibility to these sounds is that they are so exceedingly loud that we cannot hear them.”¹

The collision of bodies in space has of late years become an astronomical dogma, the latest exponent of which, Mr. Norman Lockyer, looks to the constant colliding of meteorites as the origin of the heat of stars and comets; but he says nothing of the sound which must attend these collisions. Perhaps the thunder sometimes heard out of a clear sky may result from some of the clashings of meteorites in space.

Shakespeare has immortalized the old myth of the music of the spheres in the well-known lines—

“ How sweet the moonlight sleeps upon this bank !
Here will we sit, and let the sounds of music
Creep in our ears ; soft stillness, and the night,
Become the touches of sweet harmony.
Sit, Jessica. Look how the floor of heaven
Is thick inlaid with patines of bright gold.
There's not the smallest orb which thou behold'st
But in his motion like an angel sings,
Still quiring to the young-eyed cherubins :
Such harmony is in immortal souls ;
But whilst this muddy vesture of decay
Doth grossly close it in, we cannot hear it.”

Mr. Rowbotham, in his *History of Music*, has pointed out that musical instruments fall naturally into three divisions.

I. Instruments of *percussion*, that is of the drum kind, beaten by the hand or some other implement, or clashed together like cymbals.

II. Instruments termed *inflatite*, that is played by the mouth, or by bellows inflated by air.

III. *Pulsatile* instruments, deriving their sound from strings moved by the fingers, or by some implement of wood or metal.

Following this natural classification, I purpose treating each class separately, commencing with—

¹ See Hawkins's *List. of Music*, p. 163.

I. THE DRUM.

Instruments of the drum kind, that is of percussion, are almost universal, and very varied in form, as may be supposed, when we remember that every hard substance is susceptible of being struck so as to produce some sound more or less musical; even wood may be, and is, formed into harmonicons, which struck with hammers, yield pleasing sounds. Several of these wooden harmonicons, consisting of strips of wood of various lengths, having calabashes of different sizes tied beneath to increase the volume of sound, were exhibited at the Colonial and Indian Exhibition, and it was curious to observe that instruments of this kind, of precisely similar construction, came from places as widely separated as the West Coast of Africa, the West Indies and Siam.¹ In some places earthen pots take the place of the calabashes, and metal strips replace those of wood; but the primitive invention remains the same in form and idea, though improved in sound.

Among the most curious of modern instruments of this kind must be noticed the "Rock Band," which, as originally introduced many years ago, consisted of large pieces of resonant stone, struck with hammers of various weights, which are said to have produced wonderfully musical tones. This curious band has been since improved by an ingenious musician, who, finding certain sonorous stones at the foot of Skiddaw, set to work to chip them into definite size and shape, and has succeeded in producing a set of instruments upon which the most difficult classical music can be faultlessly rendered, the tones being peculiarly clear and liquid. The great drawback to this "Rock Band" is its weight, and the necessity of great care in conveying it from place to place, as the slightest chip will alter the tone. It is, however, one of the attractions of Keswick, where the inventor and his sons play upon it daily during the

¹ The Tyrolese still use an instrument resembling these, formed of strips of wood and straw.

season, the father using three hammers, and the two sons two each. We understood that they possessed duplicates of each of the pieces, which range from several pounds to a few ounces in weight, so that in case of breakage the set might be renewed without delay. At our request the "Harmonious Blacksmith" was played on these singular instruments with marvellous effect. Here we see the most primitive of musical instruments, improved and brought into harmony with modern requirements, by the inventive genius of an unknown musician, and it is doubtless in this way that improvements have been made in past ages, the original idea remaining the same.

The Chinese appear to have stone instruments somewhat similar. They are described as consisting of stone sliced into thin plates something like a carpenter's square, arranged sixteen on a frame, and struck with a mallet. This instrument is said to date as far back as 2200 B.C., when the Emperor Yu assessed the various provinces in so many stones as part of the yearly tribute. Stone instruments were also used in ancient Peru, but they were clashed together as cymbals. It does not seem improbable that some musical instrument of stone may have been known in the very earliest times, since the chipping of flint implements may have suggested music to the savage implement maker.

The skin stretched over the knees of the Australian woman became in other lands the drum, which in many Eastern countries is still played with the hand only, and the great variety in size and form which this instrument has assumed is quite astonishing. Perhaps the most extraordinary drum of uncivilized man at the present day is that in use among the Nagas of India, which is thus described. "Outside each 'morang' (bachelor's house) is a large platform of logs of wood, on which the young men and their friends sit and smoke through the day; and hard by is an open shed, in which stands the big drum, formed out of the trunk of a huge tree hollowed out, and elaborately carved and painted in front, after the manner of the figure-head

of a ship ; it is furnished at the other end with a straight tail. The drum is raised from the ground on logs of wood. It is sounded by letting a heavy piece of wood fall against it, and by beating it with double-headed clubs. This drum calls the villagers together for war, or is beaten on festive occasions, and gives forth a deep, booming sound. Sometimes when an attack is expected from some neighbouring village, the drum is beaten at intervals throughout the night, in the hope that if the attacking party is on the way to their village, it will, on hearing the drum sounding, consider that the villagers are on the alert and return home. In large villages there are two and even three 'morangs' with their neighbouring drums."¹

In almost every country the drum in some form is employed in religious ceremonies, and it is not a little singular that in many widely-separated countries, some of which may be considered as at least partly civilized, the drum-head is still formed of snake-skin, evidently a survival from a period of serpent worship, when both the serpent and the instruments used in its worship were sacred. It is indeed probable that these drums covered with the skin of the sacred serpent were regarded as fetishes.

Mr. Rowbotham, who has made this subject a study, advances the theory that all instrumental music originated as a form of fetishism, and that the superstitions connected with the drum as a fetish, may be traced in an unbroken line from Lapland all along the north coast of Asia, crossing over at the Aleutian Islands into America, and descending through North and South America to Patagonia ; but he need not have confined his remarks to these countries, for there is quite as much fetishism connected with the drum in Africa as in Asia and America, and traces of the same may still be found gleaming through our own boasted civilization in the legends connected with that metal drum called a bell, of which we will write later.

¹ R. G. Woodthorpe, *Notes on Wild Tribes of Naga Hills, Journal, Anthropological Institute*, vol. xi. p. 202.

Wherever human sacrifices have prevailed, the drum has always played an important part in the bloody rites, having been used to drown the cries of the victims, and to strike terror in the beholders. The drum employed for this purpose in Mexico was a great cylindrical instrument made of serpent-skins, which was kept in the temple of the God of War, and when struck could be heard for an immense distance.¹ This, however, was only used on occasions of great ceremony when many victims were immolated, and the sound often struck terror to the hearts of the Spanish conquerors. The Mexicans, however, had many other drums, and amongst them one of wood, on the back of a crouching human figure. They seem also to have used a metal gong struck with a hammer.

The rattle was probably the earliest instrument of percussion known, and that called the Maraca seems to have held the place of a fetish in South America. It is a hollow gourd filled with small stones or hard seeds. This rattle used to be adorned with feathers or human hair, and had a stick fastened to it which was stuck in the ground, and thus planted it came to be regarded as the figure of a man. It was supposed to be able to foretell coming events, and was provided with food and drink, which were sometimes administered to it through a slit made to represent a mouth. Rattles of this kind seem to have been in use among the American Indians in their dances and religious ceremonies, from the earliest times to the present day, and are still the invariable accompaniment of the medicine-men, but they have also rattles made of deers'-claws, and also of a turtle-shell, to which is attached the hoofs of goats or sheep, which make a peculiar sound by rattling against the hollow shell. This rattle is tied to the right leg of dancers in certain ceremonies, and seems to have been thus used in Mexico and Central America from very ancient times, for they appear to be represented in very ancient sculptures. The turtle-shell used in this manner, doubtless has a reference to North American traditions,

¹ Eight miles, according to Bernal Diaz.

which connect the drum with the Deluge. "When the waters of the Deluge began to subside, they were drawn off into four tortoises, each tortoise receiving the waters of one quarter of the world. And these tortoises, besides serving as reservoirs, served also as drums for men to play on, by striking their backs with drum-sticks. In remembrance of this event, the Eeh-tech-Kasor, sacred drum of the medicine mysteries, are always four in number, made of buffalo-skin sewn together in the form of a tortoise, and each of them filled with water."¹

The drum and rattle combined seem to have formed the stock-in-trade of savage medicine-men both in America and Africa in all ages; and in its more civilized form of the timbrel was employed in Egypt and Palestine in religious dances, as, for example, when Miriam and her damsels sang praises for the destruction of the host of Pharaoh; when the daughter of Jephthah went forth to welcome her victorious father; and when David went forth to meet the ark; but it would seem as though the timbrel was especially assigned to women, for in almost every notice of it, the formula runs, "the maidens playing upon their timbrels." The timbrel is described and figured as a circle of meal, with metal rings attached, to form a rattle, and doubtless it was shaken in time to the rhythmic measure of the dance. The drum, on the contrary, was the instrument of the medicine-man and sorcerer, used to invoke and to drive away spirits, especially those spirits supposed to cause diseases, and it is not a little singular to find even civilized people like the Japanese using the drum in this way. We are told, "The Japanese, wishing to cure diseases of the brain, which they imagine arise from the presence of an evil spirit in the head, have fallen back on that sovereign specific of savage man, the drum, which is placed as near the burning brain as possible, and played till a cure is effected."² A curious notice of the use of a bell for the cure of madness in

¹ Rowbotham's *History of Music*, Introduction, xvi.

² *Ibid.* p. 628.

Scotland is given in Dr. Joseph Anderson's *Scotland in Early Christian Times*. It would appear that St. Fillan's bell belonging to the Monastery of Glendochart, was left for generations in the open air on a tombstone, but at the end of last century it suddenly disappeared, and was at last found in the house of an English gentleman in Hertfordshire, who had written in his diary his reasons for taking it away, which are ~~s~~ quaint enough. He said that in August 1790, he rode from Tyndrum to the holy pool of Strathfillan, which towards the end of the first quarter of the moon was resorted to by crowds of the neighbouring peasantry, who expected to be cured of their diseases by bathing in it. Amongst those he saw was an unfortunate girl, out of her mind, who had been brought there for several moons without effect. When mad people were bathed, they were thrown in with a rope tied round them, after which they were taken to St. Fillian's church, and placed in a stone trough (probably a coffin) in the open church-yard, and fastened down to a wooden framework, and there left for a whole night, with a covering of hay over them, and St. Fillian's bell placed over their head. If they were found loose in the morning the saint was supposed to be propitious. "I was told," he says, "that wherever this bell was removed, it always returned to a particular spot in the churchyard before morning;" so in order to test the truth of the story he carried it off to England, and we suppose the distance presented an insuperable barrier to its accustomed nocturnal peregrinations, for it remained in this gentleman's house for ~~line~~ ^{five} years.

We are not told whether the bell placed over the head of the lunatic was struck, or was supposed to act magically; but the fetishism connected with it is evident; as also a certain belief in the power of music to expel the evil spirit of disease, such as is familiar to us in the narrative of Saul and David, and in the accounts of travellers with regard to the drummings of savage medicine-men in many parts of the world; but it is rather surprising to find that the influence of

music over disease is becoming recognized as a scientific fact. Mr. Rowbotham gives the following—

"M. Vigoroux has invented a method of alleviating pain by administering to the affected part a recurrent series of waves of sound by means of a tuning-fork and a sounding-board. M. Boudet has, I believe, improved upon M. Vigoroux's invention by keeping the tuning-fork in constant vibration by means of an electric magnet, and communicating the undulations to the skin by means of a rod. Neuralgia is removed in a few minutes by these means, and anæsthetic effects are induced by a longer action."¹ This is one instance among many in which a truth roughly and imperfectly grasped by the ancients has been rediscovered and carried out scientifically in modern times.

It would be impossible to enumerate and describe the numerous instruments of percussion known among ancient peoples, and which have descended with various modifications to our times. Amongst them may be named the sistrum, a favourite instrument in ancient Egypt; the tambourine; cymbals, of which two kinds are mentioned among the musical instruments of the Hebrews—the loud cymbals and the well-tuned cymbals; and bells, of which many have been discovered of great antiquity, some in Nimroud of bronze, small, but resembling those at present in use, excepting that they have a hole below the handle, perhaps for the suspension of the clapper. Bronze bells were also known in Egypt, and one of copper has been found in a tomb of ancient Peru, resembling those used by Buddhist priests.

China, Burmah, and Japan seem to vie with each other in the size and variety of their instruments of percussion, and the following will give our readers a fair idea of the perpetual drummings and clangings to be heard in those far Eastern lands, and which being all in the peculiar rhythm common to those countries must be very trying to European ears. "Ten drums in every city of China beat together the hours of the day; large choir-trumpets in every city, coloured with Chinese ink,

¹ Rowbotham's *History of Music*, pt. i. p. 380.

which are the charters of cities, and are blown five at each of the four gates of the city at certain hours of the day and night eternally, and can be heard a mile off; and the bells ringing behind the Mandarins' chairs, which are rung by strings that reach three miles into the country, that the country people may thus give notice of their grievances; or the perpetual gong-beating in the Japanese pagodas, for each separate worshipper as he enters the temple strikes a sacred gong to give the god notice of his arrival. All these sounds may we listen to as they rise on the air; or to that great bell of Pekin tolling, which is one of five, and weighs 118,000 lbs., or to the great drum thirty-six feet in circumference, which stands in a tower all by itself, and is used to mark the hours.

"And as we travel southward the roar of drums and gongs gets fainter, and we hear in the distance the songs of the Siamese boatmen floating on the breeze, and the Tongan singing guilds rehearsing their anthems for the village festival; or listen to the workmen of Burmah playing musical instruments as they come home from work in the evening twilight, when the drums are just beginning to beat in the bagnios of Japan.¹"

There are Chinese bells dating from earlier than 2000 B.C., and these are nearly square, resembling in form the early Irish and Scotch bells of which so many legends are told. The bell of St. Patrick, now forming one of the chief treasures of the Royal Irish Academy, is said to be 1400 years old, and was placed in the shrine it now occupies 800 years ago. It is of hammered iron coated with bronze, like most of these ancient Celtic bells; and the shrine in which it is enclosed is of bronze with richly-decorated silver and gold panels fastened on with gold rivets. This bell was buried for safety by its keeper during the rebellion in 1798, and several other bells have also been found buried with great care, but whether for safety only, or from some old superstition, it seems almost impossible

¹ Rowbotham's *History of Music*, vol. i. p. 326.

to say. Certain it is, that bells in early Christian times were invested with attributes equivalent to the fetishism of the drums and rattles among savages.

The history of the bell, says Mr. Rowbotham, is a perfect counterpart to the history of the drum; bells being thought to speak and to be alive, bells dressed and arrayed with ornaments. Maracas could influence the fertility and sterility of the ground, and bells were rung *pro fructibus terræ* to make a good harvest. The Nachez used rattles to conjure the weather, and our forefathers hung bells in their churches to break the thunderbolt and dispel the storm. We have noticed the eccentricities of St. Fillian's belly, but another Scotch bell seems to have been quite as much attached to its own locality, known by the name of Tom Eunan; and having once been removed from it would never be silent, crying Tom Eunan, Tom Eunan, till it made its way back again.

If the Scotch bells were patriotically attached to the land of their birth or adoption, those of Ireland seem to have been of a vengeful spirit, for we learn that "King Diarmid having refused to deliver a captive whom he had taken out of sanctuary, St. Ruadhan and a bishop that was with him took the bells that they had, which they rang hardly, and cursed the king and place, and prayed God that no king or queen ever after should or could dwell at Tara, and that it should be waste for ever, and so it fell out accordingly, if we believe the ancient poem—

"‘From the judgments of Ruadhan on his house
There was no king at Teamraigh or Tara.’"¹

From which we may see that the uncrowned king may never hope to be crowned at Tara.

Here is another instance of bells being used as instruments of vengeance—"Connall, son of King Aedh, instigated by his mother, insulted St. Columba by throwing mud on him and his clerics, as they came to the assembly of Drumceat. The saint rang his bells

¹ Dr. Joseph Anderson's *Scotland in Early Christian Times*, p. 205.

and cursed the offender, who thereupon became imbecile, and was excluded from the succession.”¹

The legends of bells in England are numerous, but they refer chiefly to those which have been lost at sea, and still ring beneath the waves; but even in these legends there is a certain belief in the personality of the bells, and of a vengeful spirit lurking in them. It was because they had been sold that the vessels containing them went to the bottom, and other calamities happened. Thus, a bishop of Bangor, who sold the bells of the cathedral, was struck blind when he went to see them shipped; and Sir Miles Partridge, who won the Jesus bells of St. Paul’s, London, from King Henry VIII. at dice, was soon afterwards hanged on Tower Hill; whilst the bells of Boscastle, on account of the impiety of the captain, went down with the vessel which was bringing them over from the Continent.

“Still when the storm of Bottreaux’s waves
Is waking in his windy caves,
Those bells that sullen surges hide
Peal their deep tones beneath the tide:
‘Come to thy God in time,’
Thus saith the ocean chime;
‘Storm, whirlwind, billow past,
Come to thy God at last.’”²

The baptism of bells has always been a rite in the Romish Church, and in it we find the embodiment of the same superstition which attributes to drums and rattles among savages the power to summon or drive away spirits. The passing bell, even now tolled at the hour of death, is a relic of this belief, for it was supposed to scare away the evil spirits, and to enable the departing soul to pass on its way unmolested. A curious instance of this belief is given in Chambers’s *Book of Days*, vol. i. p. 311—“An old woman once related to the writer, how after the death of a wicked squire, his spirit came and sat upon the bell, so that all the ringers together could not toll it.”

¹ Dr. Joseph Anderson’s *Scotland in Early Christian Times*, p. 205.

² See Chambers’s *Book of Days*, for this and various curious legends of bells.

Every phase of human life in Christian countries is now ushered in by bells, as beautifully sung by Schiller, and the joys and sorrows of life are all thus announced to a community which cares little or nothing for them. Yet—

“That offspring of consuming fire,
And man’s creative hand,
High from the summit of the spire
Shall murmur o’er the land.

* * * *

Shall bid the sons of mirth be glad,
Shall tell of sorrow to the sad,
Reflection to the wise ;
Shall add to superstitious fear,
And peal in rapt devotion’s ear
The sounds of Paradise ;
And all his changeful fate brings down
On suffering man below ;
Shall murmur from its metal crown,
Or be it joy or woe.”

Mr. Rowbotham has pointed out some curious instances of *reversion* in the use of musical instruments, as that the rattles of the Mexicans were by preference in the shape of the old Maraca rattle, whilst the nose-flute is still used in the ritual of the Brahmins, although no longer known in civilized communities. A still more singular case of this reversion is to be found in Roman Catholic countries, where, during a certain time, bells are silenced, but are replaced by the primitive rattle of the ancient Chinese type, which consisted of twelve writing tablets strung together. The rattles used in Roman Catholic churches during the few days preceding Easter, are also of wooden tablets shaken together, and known as *troccole*; but I have never heard any reason assigned for their use, although the boys in Italy, who are privileged during these days to sound these clappers everywhere, even in the churches, call it “breaking the bones of Judas Iscariot.” The custom is, however, doubtless of pre-Christian origin, for we are told these wooden clappers were in use in ancient Greece.

China possesses many singular instruments of per-

cussion; but perhaps the most singular is that in the shape of a tiger, with twenty-seven wooden teeth along the back, which are scraped gently with a rod. It is impossible to associate much *music* with an instrument of this kind, or with that wooden instrument in shape of a bushel or square box, with a hammer fastened inside, to be pulled backwards and forwards by the hand. And this brings us back to the drum, that universal instrument of many forms, the smaller of which throughout the East are still played with the hand only, as represented on Egyptian and Assyrian monuments, and illustrated in that very interesting exhibition from Ceylon, which some years since was located in the Agricultural Hall.

There was a drum from the West Coast of Africa in the Colonial and Indian Exhibition, which much resembled the Chinese bushel or box drum, being made of a block of very resonant wood hollowed out, and struck with a club from the inside. The drums of the Kaffirs are their skin shields, which they clash together or strike with their assegais, whereby they approach the nearest to the very primitive drum of the Australians.

Thus we see that in all ages and in all countries these instruments of percussion, from the simple stretched skin of the Australians to the highly elaborated instruments of the Chinese, Siamese, and Japanese, and including rattles, gongs, and bells of all descriptions, have been employed in religious services, in marches and war dances, in signalling and calling together of assemblies; but in the earliest of times, and among the most barbarous peoples they were fetishes, and this fetishism still lurks in the use of bells and the superstitions attaching to them even in the most highly civilized countries.

We shall point out later how far this applies to instruments of the flute and lyre type, and how far we may follow these too into that night of ages, when music under the name of Orpheus taught stones and trees and savage beasts to move responsive to his lyre,

and well-nigh prevailed even over death and the grave ;
or to that still earlier time when, as George Eliot sings,
Jubal standing beside his brother Tubal Cain at his
smithy—

“ Watched the hammer till his eyes
No longer following its fall or rise
Seemed glad with something that they could not see,
But only listened to; some melody
Wherein dumb longings inward speech had found,
Won from the common store of struggling sound.
* * * * *
Concords and discords, cadences and cries,
That seemed from some world-shrouded soul to rise.
* * * * *
‘Twas easy following where invention trod ;
All eyes can see when light flows out from God.”

But from the simple instrument of percussion to the
innumerable inflateable and pulsatile instruments of to-
day, the progression is wonderful, and would seem to
have required the skill of many an Orpheus.

CHAPTER XVII.

PRIMITIVE INSTRUMENTS OF MUSIC.

II. THE FLUTE.

Inflatile Instruments—Flutes in Paleolithic Times—Pandean Pipes—Ornithoparcus on Jubal—George Eliot's Poem—The Bagpipe—The Horn and the Trumpet—Etruscan Bronze Trumpets found in Ireland—Trumpets of an Enemy's Arm-bone—Hebrew Trumpets—Egyptian, Assyrian, Etruscan, and Greek Pipes and Double Pipes—The Nose-Flute—Chinese Bamboo Flutes—Flutes of Peru and Mexico—Egyptian Reed Pipes with Straws Inserted—Clay Pipe of Babylon—Effect of Music upon Animals—The Organ—St. Dunstan—Krisna and Marsyas.

IN treating of those musical instruments termed *inflatile*, the flute must of necessity take the first place, being, as far as we know, the most ancient of musical instruments, for the French caves belonging to paleolithic times, which have afforded us the earliest specimens of pre-historic drawing and sculpture, have also furnished us with a proof that these remarkable cave people cultivated the art of music, since, amongst other relics, has been found a wind instrument of the flute kind, made of bone, and pierced with two holes. It is of course possible that other musical instruments may have been known in those remote times, but stringed instruments would have quickly decayed, leaving no trace, and wooden drums would not have been much more durable; but it remains to be discovered whether some of the heavy chipped stones called implements may not also have served as musical instruments, after the manner of the Chinese harmonicons and the modern

rock band.¹ For the present we must be content to believe that this flute, the origin of which was probably the hollow reed growing on the margins of their lakes and rivers, was the first of all musical instruments.² Doubtless these reeds would soon be arranged in a cluster of different lengths, like those still forming the Pandean pipes, which perhaps of all musical instruments is the one which has varied least in form since those far-distant Arcadian days, when Pan, the god of nature in its rudest form, piped to the skin-clad fauns and satyrs of the primeval forest, causing them to dance to

“The dreary melody of bedded reeds,
In desolate places where dank moisture breeds
The pipy hemlock to strange overgrowth.”

And from this primitive instrument, through various stages, has been elaborated the mighty organ, with all its complicated machinery and wonderful modulations.

The earliest instrument which can be called an organ was probably the Hebrew *Masrakitha*, which resembled Pandean pipes fitted into a kind of wooden chest open at the top, but at the bottom stopped with wood and covered with a skin. “By means of a pipe fixed to this chest, wind was conveyed into it from the lips.”³

It is somewhat remarkable that the rise of almost all the arts is attributed in the Bible to the posterity of Cain. Cain himself is described as the first builder of cities, and therefore the first architect; whilst to the

¹ The Caribs and Tamanacs still show the “Drum of Amalivaca bedded in the rock, with which, Amphion-like, he brought order out of chaos and the elements into harmony after the devastation of the Deluge” (Rowbotham’s *History of Music*, p. 26). This would seem to denote a very early knowledge of the musical properties of stone.

² We must not, however, forget that it is quite as likely that the flute may have been accidentally discovered quite as early as the stone drum, in blowing or sucking marrow from a broken bone, and the fact that the earliest flutes, or rather *whistles*, discovered, have been of bone, favours this view; as also the fact recorded by Thunberg, that “when a Caffre has discovered a spot where several buffaloes have assembled, he blows a pipe made of the thigh-bone of a sheep, which is heard at a great distance.”

³ Hawkins’s *History of Music*, cap. xx.

sons of his descendant Lamech, with his two wives, are assigned the origin of two of the most important arts of civilization. Tubal Cain is described as the "instructor of every artificer in brass and iron," whilst Jubal is called "the father of all such as handle the harp and organ." "Not," says Andreas Ornithoparcus, "that he was the inventor of those instruments, for they were invented long after; but that he was the inventor of music, that is, of the consonances (discovered by him by the sounds produced by three hammers of different weights striking upon the same anvil). As the pastoral life was rendered delightful by his brother, so he, working in the smith's art, and delighted with the sound of the hammers by means of their weights, carefully investigated the proportions and consonances arising from them. And because he had heard that Adam had prophesied of the two tokens (*i. e.* water and fire), he, lest this art which he had invented should be lost, wrote and engraved the whole of it on two pillars, one of marble (or others say brass), that it might not be washed away by the Deluge, and the other of brick, which could not be dissolved by fire; and Josephus says that the marble one is still extant in the land of Syria, so that the Greeks are greatly mistaken in ascribing the invention of this art to Pythagoras the philosopher."¹ It will be seen that the Hebrew legend attributes to Jubal the invention of both harp and organ, and doubtless there were very primitive instruments, both inflatile and pulsatile, known to the Hebrews from a very early date. George Eliot, in the *Legend of Jubal*, gives us a poetical biography, perhaps derived from some Talmudic story, in which she pictures the antediluvian musician as a youth drawing inspiration from all natural sounds, until he formed the lyre, and charmed therewith his own people, but becoming disgusted with their imitations of his invention, he determined to travel to distant lands, where music was unknown, and thus—

"He lingered wandering for many an age,
And sowing music, made high heritage

¹ *Microlagus*, translated by Douland, 1609.

For generations far beyond the Flood,
For the poor late begotten human brood
Born to life's weary brevity, and perilous good,"

—until grown old and infirm he determined to revisit his own land, and arrived to see a long procession

"With lyres and cymbals, flutes and psalteries,
While men, youths, maid, in concert sang to these
With various throat, or in succession poured,
Or in full volume mingled."

And he finds that during his absence not only have men improved and multiplied his invention, but they have made of him a god, and all this solemn festival is in his honour. Yet when he reveals himself, he is received with shouts of derision; treated as a madman, and beaten to death with their flutes. But as he lies dying, alone, scorned and unknown, a vision of the Past is sent to comfort him, and to show him how great a benefactor he had been to mankind,

"Who found and gave new passion and new joy,
That nought but earth's destruction can destroy."

This legend holds a moral, easy of application in many cases. We are far too apt to forget our indebtedness to the early pioneers of knowledge, and to ignore the difficulties they must have experienced; and because we have been enabled by superior skill, or rather with superior implements, to perfect that which they only imperfectly conceived, we are proud of our works, and do not give due honour to the long deceased and half-forgotten inventor, who surely deserves all the praise of the original idea.

Give to our most skilful organ-builder the stone knives and hammers of the pre-historic workman, and he would declare it impossible to do anything with such tools; yet with such tools alone the primitive workman wrought out for himself ornamental designs and elaborated instruments of music, which have not been superseded, but only perfected, by modern science. And with the exception of Jubal, the flood of ages has carried away all trace of the names of

those early inventors ; but although they have vanished from the world's history, or survive only in some weird and fanciful old-world legends, the arts in which they laboured have not died ; they have survived the flood of oblivion and all the wars and revolutions which have shaken the world, and they have advanced with the advancing tide of civilization, until they have become the most precious of our possessions ; for how cold and colourless would life become without that harmony of sound produced by instruments formed by means of the forge and anvil, on the model of those of far-away prehistoric workmen !

The progress of music in very early times can only be traced through rare archæological discoveries, or through the records of the sister arts of sculpture and painting. The Bible makes no mention of any musical instrument between the time of Jubal and of Moses ; but we know by the sculptures and paintings of Egypt and Assyria that both wind and stringed instruments had wonderfully increased in number and improved in mechanism during the intervening ages, being chiefly employed in religious processions and dances. Jubal, the early legendary inventor, had wandered through the earth to some purpose, for everywhere musical instruments more or less complex sprang up, but the basis of all wind instruments was the flute.

“ Thus, long ago,
Ere heaving bellows learn'd to blow,
While organs yet were mute,
Timotheus to his breathing flute
And sounding lyre,
Could swell the soul to rage and kindle soft desire.”

The primitive bone flute of the cave men of France, and the clustered reeds of old Pan, gave birth to many modifications, in some of which wind and water were introduced to supplement or to take the place of human breath. The bagpipe was doubtless a very early invention ;¹ it is still used in a very primitive form in

¹ A bagpipe, or rather Pan-pipes, played with bellows, is seen in a figure from Tarsus discovered by Mr. Burchardt Barker.

Italy, and was probably known in many other countries ; one such instrument being known among the Hebrews as the sackbut. It is easy to understand the origin of the bagpipe, for we know that the skins of animals slain for food were used for various purposes, as for holding water, wine, and corn, and swimming across rivers, as may be seen portrayed in the Assyrian monuments ; and we know that an inflated skin will upon pressure give a sound more or less musical, and this joined to the flute already invented would become the bagpipe. By the same process of evolution the hemlock pipe probably suggested the use of the horns of animals, and the horn gave birth to the trumpet, which has played such an important part in solemn ceremonies in all ages. Trumpets of rams'-horns were used at the capture of Jericho, but among the furniture of the first tabernacle, so carefully described by Moses, the only musical instruments named were the silver trumpets, to be used for calling together the congregation and sounding an alarm, as also for blowing on solemn occasions over the sacrifices, and proclaiming the year of jubilee. It is probably in conformity with this record of the selection of the trumpet only, as the sacred instrument enjoined by Moses, that the Pope at the present day allows no musical instrument to be used at any solemn service of the church at which he is present, excepting the silver trumpets said to have been taken from the temple of Jerusalem. Trumpets of bronze appear to have been used in very ancient times ; they have been found in Etruscan tombs, and of an identical form in Ireland. Among the musical instruments in the South Kensington Museum, described by Engel, is a trumpet formed of a human thigh-bone, from Bhotan ; and we are told that there, and also among the Lamas of Sikkim, similar trumpets are used as sacred instruments, being valued according to their length ; and Dr. Hooker relates that one of the first Europeans buried at Darjiling was disinterred on account of the length of his thigh-bone, which was made into one of these trumpets. According to Klaproth, the Lamas of

the Kalmucs use trumpets in their religious ceremonies made of the long arm-bone of a slain enemy.

Among the musical instruments of the Hebrews we find mention of all manner of instruments of fir-wood, harps, psalteries, timbrels, cornets, and cymbals, as used in the time of David; but the trumpet remained the instrument of the priesthood, the other instruments being assigned to the Levites or to unconsecrated musicians. The prophets speak of the tabret and viol and harp as used at feasts; and Christ puts into the mouth of the children sitting in the market-place the words, "We have piped unto you, and ye have not danced."

Egyptian and Assyrian, Etruscan and Greek sculptures and paintings give us the forms of numerous musical instruments both inflatile and pulsatile; but of the former the most common forms were the pipe and the double pipe, which seem to have been the especial instruments of dancers.

The Chinese, who class their musical instruments under eight different natural sounds, place the flute under that of the bamboo, showing that there, as in Europe, the reed was regarded as the origin of the flute; but the Chinese have also wind instruments in the shape of eggs, and others in the form of a gourd, which are known as mouth-organs. The flute, in its earliest stage, appears to have been played with the nose; and, as we mentioned in a former chapter, the nose-flute is still used by the Brahmins in their religious rites, as also in some of the South Sea Islands; but the flute is regarded in India as the invention of Krisna, who is always represented in a dancing attitude, playing on that instrument. The instrument of Vishnu is the shell-trumpet, which is used also in Japan, Ceylon, many of the South Sea Islands, and in America, as formerly in ancient Peru; and in this connection it may be interesting to quote a remark of Mr. Rowbotham, who says that "the scale of five notes is common to the Chinese, Siamese, Burmese, Japanese, Peruvians, Mexicans, and Javans, and that the oldest metre in China is an exact counterpart to another Peruvian metre." This

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would seem to be one proof among many that some intercourse formerly existed between the eastern and western hemispheres. The Peruvians, according to Garcillasso, played their songs to the flute; and in Mexico the flute was played by the youths who were sacrificed yearly to the god of music; one flute being broken by the victim on every step leading to the sacrificial altar, to show that all his earthly pleasures were at an end.

Trumpets, flutes, and bone whistles were played by the musicians in those wonderful dances of the Mexicans, in which princes, nobles, and elders joined with women and little children, forming circles in which four or five thousand danced at once, all keeping time to the sound of the drums and other musical instruments.

The dances of the salt-makers must have been especially beautiful, the dancers being encircled with chains of flowers, and having garlands of sweet-smelling herbs on their heads, whilst the musicians played on shell instruments. The Mexicans had also many curious musical whistles made in the shape of birds, frogs, men's heads, and even, it is said, of the human lungs; then they had instruments resembling the Chinese egg-instruments, and pipes and rattles combined in the form of three human heads, which were filled with stones to make a rattle, whilst the pipe stood up in the centre.¹

The traditions of Greece and Rome make Minerva the inventor of the flute, but add that she threw it away because it distorted her features, and took the lyre instead. It would seem that loudness was the first requisite in Greek music, for we are told that "a young flute-player named Harmonides, at his first public appearance at the Olympic games, began a solo with so violent a blast on purpose to surprise and elevate the audience, that he breathed his last breath into his flute, and died on the spot; and the trumpet-players at these public exhibitions expressed an excess of joy when they

¹ See Rowbotham's *History of Music*, and Engel's *Music of the Most Ancient Nations*.

found their exertions had neither rent their cheeks nor burst their blood-vessels."¹

The Egyptian flute, judging from the paintings, seems to have been an instrument of great length. Reed pipes containing straws have been found in Egyptian tombs, and remnants of such pipes may be seen in the British Museum, whilst the double pipe seems to have been a very favourite instrument, not only in Egypt, but in Assyria and in ancient Etruria. This double pipe was known among the Romans as *tibiae pares*, and was formed of the leg-bones of cranes. Bones of animals have doubtless served as pipes in many countries, even as their horns have been used in all ages as musical instruments. In some parts of Africa the leg-bone of a sheep is still used to call men and cattle; and on the same continent trumpets are made of elephants' tusks hollowed out; but the African instruments of music are generally rather of the drum and lyre than the inflate type, although a very singular instrument of the latter kind was brought over by the Kaffirs who came to the Colonial and Indian Exhibition. It resembled a long, thickish stick, and was played by the mouth, yielding three or four notes, the tones being brought out by suction. A little pipe of baked clay was found in the ruins of Babylon, and can still be made to produce the original notes, three in number. The resemblance of this pipe or rather whistle to those of ancient Mexico, both in form and material, is a fact of anthropological interest.

The effect of music upon animals is well known, and the legends in various countries of a musician who draws savage beasts and even stocks and stones to dance to the music of the lyre, are only poetic exaggerations founded upon fact. The seal, it is certain, will follow music to its own destruction, and in mountainous countries a long wooden pipe or trumpet, called an Alp-horn in Switzerland and a lure in Norway, is used, as well as the musical jödl, to call home the cattle.

Sir E. Tennant speaks of the use of music in helping

¹ *Encyclopædia Britannica*, 8th edition : Article, "Music."

to tame the wild elephants, and says—"The mellow note of a Kandyan ivory flute at a distance had a striking effect upon one or more of the elephants; they turned their heads in the direction from which the music came, expanded their broad ears, and were evidently soothed by the plaintive sound of the Bansee."

A quaint old writer, quoted by Hawkins, says—“Calamus hath that name of thys worde, *Calando*, sowning; and is the general name of pypes. A pype hyghte Fistula for voyse cometh therof. Hunters useth this instrument, for hartes louyth the noyse therof. But whyle the harte taketh hede and likynge in the pypyng of an hunter, another hunter, whyche he hath no knowlege of, comyth and shoteth at the harte, and sleeth hym. Pypyng begyleth byrdes and fowles, therfor it is sayd, ‘the pype syngeth swetely whyle the fowler begyleth the byrde.’ And shepe louyth pypyng, therfore shepherdes usyth pypes when they walk wyth theyr shepe. Therefore one whych was callyd Pan was callyd God of hirdes, for he joyned dyverse redes, and arayed them to sowne slyghly and craftely, Virgil spekyth therof. And with pypes, watchyne men pleyseth such men as restyth in beddes, and makyth theym slepe the sooner and more swetely by melodye of pypes.”¹

The modern or rather mediæval legend of the *Pied Piper* will occur to readers in this connection, but this probably is only a late version of an extremely ancient myth. Browning says—

“Poor piper as I am,
In Tartary I freed the Cham
Last June, from his huge swarms of gnats ;
I eased in Asia the Nizam
Of a monstrous brood of vampyre bats.”

By which he would indicate the Eastern origin of the myth.

That the organ should have sprung from the Pandean pipes, with a bag of wind attached, is easy to understand; indeed most writers believe the organ of Jubal to have been an instrument of this kind, as noticed above

¹ *Bartholomæus. Tr. of Trevisa.*

under the name of *Masrakitha*, which is perhaps the same as the *Magrepha* described in the *Talmud* as a powerful organ, which stood in the Temple of Jerusalem, having a wind-chest with ten holes, each containing a pipe capable of emitting ten different sounds, by means probably of finger-holes; thus this organ could be made to yield one hundred different sounds. It is also said to have been provided with two pairs of bellows and ten keys, and could be heard for an immense distance. This description is doubtless much exaggerated; nevertheless, the Hebrews were good musicians, deriving their musical instruments from Egypt, Phoenicia, and Assyria, nations with which they came in contact from time to time, but apparently avoiding the drum and the flute in their religious ceremonies, perhaps because these instruments were especially devoted to the gods of the heathen; the flute especially being used in that widely-distributed ceremony, known as the lamentation for the death of Osiris, Linus, Adonais, Orpheus, and various other names.

As we have before said, the only musical instrument laid up in the first tabernacle was the silver trumpet, and even to the present day the *shophar*, which is a curved horn, is blown in Jewish synagogues on the New Year's festival; and Engel remarks that "the signals blown on the shophar are said to be the same, at least rhythmically, as those which were used more than three thousand years ago."

The organ in its present form is said to have been invented by Archimedes, B.C. 220; but the invention is also attributed to Ctesibius, a barber of Alexandria, a few years earlier, and was first used in churches, A.D. 657; but we are told that "the Chinese as well as the Japanese possess two distinct instruments which in construction bear a remarkable resemblance to our organ. One of these, the *cheng* of the Chinese, consists of a box or bowl, into which a number of tubes of different length and pitch are inserted.¹ Each of the tubes contains a small metallic tongue, like the so-called *free-reed* stops

¹ In Scotland the organ is still known as "a kist o' whistles."

of our organ. The instrument is made to sound by being blown with the mouth through a kind of spout at the side of the bowl, and the tubes have holes to be played upon with the fingers. In Laos and Siam there is also a species of organ constructed on a principle similar to the *cheng*, though entirely dissimilar in outward appearance."¹

France can boast of the earliest organ, which was sent as a present to King Pepin, A.D. 757, from the Emperor Constantine VI., but in Italy, Germany, and England, the instrument became common in the 10th century, although Bingham asserts that there were no such things as organs in use in the ancient church, and that it was the general opinion of the learned in his days that organs were not introduced into churches till after the time of Thomas Aquinas, A.D. 1215. It is, however, generally supposed that we owe to St. Dunstan the first introduction of the organ into our English churches. It was perhaps whilst forging some portion of an organ—for Dunstan was a skilful smith as well as musician—that the celebrated interview with the devil took place, rendered familiar to us by the engravings and descriptions in old books. One night, says the legend, as Dunstan was hammering away at his forge, the devil, who had been accustomed to annoy the saint in the form of a bear, or a serpent, or a great black dog, came to him as a beautiful woman; but Dunstan, seizing the concealed fiend with his red-hot pincers, compelled the devil to reveal himself with tail, horns, hoofs, and fiery eyes in approved satanic guise; whilst his horrible cries alarmed the whole neighbourhood.

The reason for the selection of St. Cecilia as patroness of sacred music, and especially of the organ, is not quite clear; there seems, however, a legend connected with her, which relates that an angel descended to listen to her music, and this legend has called forth two odes in our own language. Dryden sings—

“At last divine Cecilia came,
Inventress of the vocal frame,

¹ Engel's *Music of the Most Ancient Nations*, p. 18.

The sweet enthusiast, from her sacred store,
Enlarged the former narrow bounds,
And added length to solemn sounds,
With nature's mother-wit, and arts unknown before ;
Let old Timotheus yield the prize,
Or both divide the crown ;
He raised a mortal to the skies,
She drew an angel down."

And Pope repeats the story—

" When the full organ joins the tuneful choir,
Th' immortal pow'rs incline their ear;
Borne on the swelling notes our souls aspire,
While solemn airs improve the sacred fire ;
And angels lean from heav'n to hear.
Of Orpheus now no more let poets tell,
To bright Cecilia greater pow'r is given ;
His numbers raised a shade from hell,
Hers lift the soul to heav'n."

The best-known picture of St. Cecilia represents her with an instrument something like that portrayed in the ancient bagpipe from Tarsus, figured by Engel, consisting of a chest, in which is inserted a graduated set of Pandean pipes, which was doubtless the artist's representation of the most ancient instrument of the organ type which he had seen figured or described.

It is difficult to know what constitutes sacred music; nevertheless in all countries certain strains have been from the very earliest ages regarded as appropriate to the worship of the gods. Perhaps to the scientific musician, a certain set of chords arranged in definite form is known to affect particular nerves, and thus to produce devout emotions, or feelings of religious fervour—emotions differing from those produced by other combinations, in that they calm and elevate even whilst rousing to enthusiasm, whereas in secular music the passions roused are unrestrained by moral and religious feelings. But such scientific niceties were unknown in the remote past, yet everywhere certain instruments and certain tones have been used in religious ceremonies only.

Drums, rattles, and bells are everywhere instruments devoted to solemn uses, next to these the trumpet

and the organ, whilst the flute and the pipe seem to have been instruments of festivity, aided in ancient civilized countries by pulsatile instruments, and by the sistrum, cymbals, crotalas, triangles, and other light instruments of percussion. Trumpets and horns appear to be particularly devoted to war and the chase, whilst the lighter form of drum is an important aid to martial ardour; but no instrument of modern times has so great an effect upon the spirits of our warriors as the bagpipe, and many are the stories related of the almost magical effect of the "pipes" on Highlanders in battle, and the terror with which they struck the enemy.

The effect of particular instruments and particular tunes upon men and the lower animals would require many volumes, for in almost every country some especial tune, sung to the accompaniment of some one musical instrument, is employed for special purposes, and these national tunes cannot be separated from national dances, which form such an interesting ethnological study. Many of these, with their appropriate music, are well known to most people: the Italian tarantella, the Spanish bolero, the Polish mazurka, the Scottish and Danish reel, the Irish jig, the sailor's hornpipe, are some of these; but we know little or nothing of the equally distinctive dances and tunes of Asia, Africa, Aboriginal America, and Polynesia.

To a certain extent we can judge of the dances of the ancient Egyptians, Assyrians, Etruscans, Greeks, and Romans, by extant sculptures and paintings, and in almost all these dances, both ancient and modern, the pipe in some form, sometimes alone, and sometimes in conjunction with other instruments, is used as an accompaniment. The pipe or flute is everywhere referred to as the instrument of love and pleasure. Pan piped to the fauns, satyrs, and wood nymphs. Krisna charmed with his flute the maidens of India; yet when Apollo had invented the lyre, Marsyas in vain tried to charm mankind, even with Minerva's own pipes; for then not only were the feet free to join in the dance, but the mouth was also set free to add voice to the

charms of instrumental music; and though some, like Midas, remained true to the older form of instrument, the very reeds conspired together to announce to the world, "Midas hath ass's ears," and when Orpheus arose, the very rocks and woods, beasts of the field, and birds of the air, were powerless to resist his song accompanied by the perfected lyre; nevertheless, the pipe has not even yet quite lost its power, for to the present day, the dreaded cobra is called from his hole and made to dance to the music of the Indian pipe; and children, even as in the days of the Pied Piper of Hamelin, will swarm at the heels of the travelling performer on the bagpipe; though the rats have grown wiser, warned perhaps by the tradition handed down by their gray-beards, of the fate of their brethren; and like the deaf adder, they refuse to hear "the voice of the charmer, charm he never so wisely."

Of the myth of Orpheus I purpose to treat in another chapter, for it is inseparable from the lyre, which ushers in the third great step in the musical history of the ancient world. Suffice it here to say, that there still remain Arcadias, where dusky beauties dance to the sound of the primitive syrinx of Pan, or to that singular variety, the nose flute, and where Orpheus and his lyre are all unknown, for the lyre would seem to have been confined to the Eastern hemisphere, and not to have penetrated to America and the Oceanic Isles until introduced by Europeans; and stringed instruments are still wanting in many groups of the Pacific Islands. It seems strange that the civilized Mexicans and Peruvians should not have possessed stringed instruments, especially as they had so many other things in common with China and Japan; and we cannot help thinking it probable that some sort of lute or harp will be found to have been in use among them, although they seem to have given the preference to instruments of percussion, and to those of the inflatile type. Catlin mentions lutes as in use among the North American Indians; but Mr. Rowbotham refuses to believe in the existence of that which would rather militate against

his theory of the succession of musical instruments, and which affirms that should one of the three kinds be rejected, it is always the drum or the flute, and never the lyre. It is, however, certain, that hitherto stringed instruments have not been found among the ancient relics of America, although Engel tells us that the Peruvians had a lyre of five or seven strings.

NOTE.—In the *Journal of the Anthropological Institute* for November 1890 is an interesting article upon the old British “Pibcorn,” or “Hornpipe,” compared with hornpipes and bagpipes from the Grecian Archipelago, Arab reed-pipes, Deckhan pipes and Hindoo hornpipes, giving illustrations of these instruments, and quotations from Chaucer, Spenser, and other early poets, showing the ancient use of the pibcorn, cornpipe, or hornpipe, in Great Britain.

CHAPTER XVIII.

PRIMITIVE INSTRUMENTS OF MUSIC.

III. THE LYRE.

Traditional Origin of the Lyre—The Tortoise in Asia and America—The Search for Osiris—Transferred to Orpheus—Same Myth in Mexico and Peru—The Lyre in South and West Africa—The Bent Bow the Precursor of the Harp—Egyptian and Assyrian Harps—Old Irish Harp—Semitic Lyre—The Lyre of Apollo—The Shell of the Tortoise imitated in Gourds—The Plectrum in the East—The Vina, or Bina—Strings of the Lyre vary in Number—Pythagorean Lyre—The Three Measures—The Story of Orpheus—Introduced into Britain by the Romans—Tesselated Pavements—Diodorus Siculus and Stonehenge—Sun Dances—Merlin and Amphion—Aldhelm and his Harp—Nero—Troubadours.

“Now strike the golden lyre again,
A louder yet, and yet a louder strain ;
Break his bands of sleep asunder,
And rouse him like a rattling peal of thunder.”

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would seem to be one proof among many that some intercourse formerly existed between the eastern and western hemispheres. The Peruvians, according to Garcillasso, played their songs to the flute; and in Mexico the flute was played by the youths who were sacrificed yearly to the god of music; one flute being broken by the victim on every step leading to the sacrificial altar, to show that all his earthly pleasures were at an end.

Trumpets, flutes, and bone whistles were played by the musicians in those wonderful dances of the Mexicans, in which princes, nobles, and elders joined with women and little children, forming circles in which four or five thousand danced at once, all keeping time to the sound of the drums and other musical instruments.

The dances of the salt-makers must have been especially beautiful, the dancers being encircled with chains of flowers, and having garlands of sweet-smelling herbs on their heads, whilst the musicians played on shell instruments. The Mexicans had also many curious musical whistles made in the shape of birds, frogs, men's heads, and even, it is said, of the human lungs; then they had instruments resembling the Chinese egg-instruments, and pipes and rattles combined in the form of three human heads, which were filled with stones to make a rattle, whilst the pipe stood up in the centre.¹

The traditions of Greece and Rome make Minerva the inventor of the flute, but add that she threw it away because it distorted her features, and took the lyre instead. It would seem that loudness was the first requisite in Greek music, for we are told that "a young flute-player named Harmonides, at his first public appearance at the Olympic games, began a solo with so violent a blast on purpose to surprise and elevate the audience, that he breathed his last breath into his flute, and died on the spot; and the trumpet-players at these public exhibitions expressed an excess of joy when they

¹ See Rowbotham's *History of Music*, and Engel's *Music of the Most Ancient Nations*.

found their exertions had neither rent their cheeks nor burst their blood-vessels."¹

The Egyptian flute, judging from the paintings, seems to have been an instrument of great length. Reed pipes containing straws have been found in Egyptian tombs, and remnants of such pipes may be seen in the British Museum, whilst the double pipe seems to have been a very favourite instrument, not only in Egypt, but in Assyria and in ancient Etruria. This double pipe was known among the Romans as *tibiae pares*, and was formed of the leg-bones of cranes. Bones of animals have doubtless served as pipes in many countries, even as their horns have been used in all ages as musical instruments. In some parts of Africa the leg-bone of a sheep is still used to call men and cattle; and on the same continent trumpets are made of elephants' tusks hollowed out; but the African instruments of music are generally rather of the drum and lyre than the inflatile type, although a very singular instrument of the latter kind was brought over by the Kaffirs who came to the Colonial and Indian Exhibition. It resembled a long, thickish stick, and was played by the mouth, yielding three or four notes, the tones being brought out by suction. A little pipe of baked clay was found in the ruins of Babylon, and can still be made to produce the original notes, three in number. The resemblance of this pipe or rather whistle to those of ancient Mexico, both in form and material, is a fact of anthropological interest.

The effect of music upon animals is well known, and the legends in various countries of a musician who draws savage beasts and even stocks and stones to dance to the music of the lyre, are only poetic exaggerations founded upon fact. The seal, it is certain, will follow music to its own destruction, and in mountainous countries a long wooden pipe or trumpet, called an Alp-horn in Switzerland and a lure in Norway, is used, as well as the musical jödl, to call home the cattle.

Sir E. Tennant speaks of the use of music in helping

¹ *Encyclopaedia Britannica*, 8th edition : Article, "Music."

to tame the wild elephants, and says—"The mellow note of a Kandyan ivory flute at a distance had a striking effect upon one or more of the elephants; they turned their heads in the direction from which the music came, expanded their broad ears, and were evidently soothed by the plaintive sound of the Bansee."

A quaint old writer, quoted by Hawkins, says—“Calamus hath that name of thys worde, *Calando*, sowning; and is the general name of pypes. A pype hyghte Fistula for voyse cometh therof. Hunters useth this instrument, for hartes louyth the noyse therof. But whyle the harte taketh hede and likynge in the pypyng of an hunter, another hunter, whyche he hath no knowlege of, comyth and shoteth at the harte, and sleeth hym. Pypyng begyleth byrdes and fowles, therfor it is sayd, ‘the pype syngeth swetely whyle the fowler begyleth the byrde.’ And shepe louyth pypyng, therfore shepherdes usyth pypes when they walk wyth theyr shepe. Therefore one whych was callyd Pan was callyd God of hirdes, for he joyned dyverse redes, and arayed them to sowne slyghly and craftely, Virgil spekyth therof. And with pypes, watchyne men pleyseth such men as restyth in beddes, and makyth theym slepe the sooner and more swetely by melodye of pypes.”¹

The modern or rather mediæval legend of the *Pied Piper* will occur to readers in this connection, but this probably is only a late version of an extremely ancient myth. Browning says—

“Poor piper as I am,
In Tartary I freed the Cham
Last June, from his huge swarms of gnats ;
I eased in Asia the Nizam
Of a monstrous brood of vampyre bats.”

By which he would indicate the Eastern origin of the myth.

That the organ should have sprung from the Pandean pipes, with a bag of wind attached, is easy to understand; indeed most writers believe the organ of Jubal to have been an instrument of this kind, as noticed above

¹ *Bartholomæus. Tr. of Trevisa.*

under the name of *Masrakitha*, which is perhaps the same as the *Magrepha* described in the *Talmud* as a powerful organ, which stood in the Temple of Jerusalem, having a wind-chest with ten holes, each containing a pipe capable of emitting ten different sounds, by means probably of finger-holes; thus this organ could be made to yield one hundred different sounds. It is also said to have been provided with two pairs of bellows and ten keys, and could be heard for an immense distance. This description is doubtless much exaggerated; nevertheless, the Hebrews were good musicians, deriving their musical instruments from Egypt, Phoenicia, and Assyria, nations with which they came in contact from time to time, but apparently avoiding the drum and the flute in their religious ceremonies, perhaps because these instruments were especially devoted to the gods of the heathen; the flute especially being used in that widely-distributed ceremony, known as the lamentation for the death of Osiris, Linus, Adonais, Orpheus, and various other names.

As we have before said, the only musical instrument laid up in the first tabernacle was the silver trumpet, and even to the present day the *shophar*, which is a curved horn, is blown in Jewish synagogues on the New Year's festival; and Engel remarks that "the signals blown on the shophar are said to be the same, at least rhythmically, as those which were used more than three thousand years ago."

The organ in its present form is said to have been invented by Archimedes, B.C. 220; but the invention is also attributed to Ctesibius, a barber of Alexandria, a few years earlier, and was first used in churches, A.D. 657; but we are told that "the Chinese as well as the Japanese possess two distinct instruments which in construction bear a remarkable resemblance to our organ. One of these, the *cheng* of the Chinese, consists of a box or bowl, into which a number of tubes of different length and pitch are inserted.¹ Each of the tubes contains a small metallic tongue, like the so-called *free-reed* stops

¹ In Scotland the organ is still known as "a kist o' whistles."

of our organ. The instrument is made to sound by being blown with the mouth through a kind of spout at the side of the bowl, and the tubes have holes to be played upon with the fingers. In Laos and Siam there is also a species of organ constructed on a principle similar to the *cheng*, though entirely dissimilar in outward appearance."¹

France can boast of the earliest organ, which was sent as a present to King Pepin, A.D. 757, from the Emperor Constantine VI., but in Italy, Germany, and England, the instrument became common in the 10th century, although Bingham asserts that there were no such things as organs in use in the ancient church, and that it was the general opinion of the learned in his days that organs were not introduced into churches till after the time of Thomas Aquinas, A.D. 1215. It is, however, generally supposed that we owe to St. Dunstan the first introduction of the organ into our English churches. It was perhaps whilst forging some portion of an organ—for Dunstan was a skilful smith as well as musician—that the celebrated interview with the devil took place, rendered familiar to us by the engravings and descriptions in old books. One night, says the legend, as Dunstan was hammering away at his forge, the devil, who had been accustomed to annoy the saint in the form of a bear, or a serpent, or a great black dog, came to him as a beautiful woman; but Dunstan, seizing the concealed fiend with his red-hot pincers, compelled the devil to reveal himself with tail, horns, hoofs, and fiery eyes in approved satanic guise; whilst his horrible cries alarmed the whole neighbourhood.

The reason for the selection of St. Cecilia as patroness of sacred music, and especially of the organ, is not quite clear; there seems, however, a legend connected with her, which relates that an angel descended to listen to her music, and this legend has called forth two odes in our own language. Dryden sings—

“At last divine Cecilia came,
Inventress of the vocal frame,

¹ Engel's *Music of the Most Ancient Nations*, p. 18.

The sweet enthusiast, from her sacred store,
Enlarged the former narrow bounds,
And added length to solemn sounds,
With nature's mother-wit, and arts unknown before ;
Let old Timotheus yield the prize,
Or both divide the crown ;
He raised a mortal to the skies,
She drew an angel down."

And Pope repeats the story—

"When the full organ joins the tuneful choir,
Th' immortal pow'rs incline their ear;
Borne on the swelling notes our souls aspire,
While solemn airs improve the sacred fire ;
And angels lean from heav'n to hear.
Of Orpheus now no more let poets tell,
To bright Cecilia greater pow'r is given ;
His numbers raised a shade from hell,
Hers lift the soul to heav'n."

The best-known picture of St. Cecilia represents her with an instrument something like that portrayed in the ancient bagpipe from Tarsus, figured by Engel, consisting of a chest, in which is inserted a graduated set of Pandean pipes, which was doubtless the artist's representation of the most ancient instrument of the organ type which he had seen figured or described.

It is difficult to know what constitutes sacred music; nevertheless in all countries certain strains have been from the very earliest ages regarded as appropriate to the worship of the gods. Perhaps to the scientific musician, a certain set of chords arranged in definite form is known to affect particular nerves, and thus to produce devout emotions, or feelings of religious fervour—emotions differing from those produced by other combinations, in that they calm and elevate even whilst rousing to enthusiasm, whereas in secular music the passions roused are unrestrained by moral and religious feelings. But such scientific niceties were unknown in the remote past, yet everywhere certain instruments and certain tones have been used in religious ceremonies only.

Drums, rattles, and bells are everywhere instruments devoted to solemn uses, next to these the trumpet

and the organ, whilst the flute and the pipe seem to have been instruments of festivity, aided in ancient civilized countries by pulsatile instruments, and by the sistrum, cymbals, crotalas, triangles, and other light instruments of percussion. Trumpets and horns appear to be particularly devoted to war and the chase, whilst the lighter form of drum is an important aid to martial ardour; but no instrument of modern times has so great an effect upon the spirits of our warriors as the bagpipe, and many are the stories related of the almost magical effect of the "pipes" on Highlanders in battle, and the terror with which they struck the enemy.

The effect of particular instruments and particular tunes upon men and the lower animals would require many volumes, for in almost every country some especial tune, sung to the accompaniment of some one musical instrument, is employed for special purposes, and these national tunes cannot be separated from national dances, which form such an interesting ethnological study. Many of these, with their appropriate music, are well known to most people: the Italian tarantella, the Spanish bolero, the Polish mazurka, the Scottish and Danish reel, the Irish jig, the sailor's hornpipe, are some of these; but we know little or nothing of the equally distinctive dances and tunes of Asia, Africa, Aboriginal America, and Polynesia.

To a certain extent we can judge of the dances of the ancient Egyptians, Assyrians, Etruscans, Greeks, and Romans, by extant sculptures and paintings, and in almost all these dances, both ancient and modern, the pipe in some form, sometimes alone, and sometimes in conjunction with other instruments, is used as an accompaniment. The pipe or flute is everywhere referred to as the instrument of love and pleasure. Pan piped to the fauns, satyrs, and wood nymphs. Krisna charmed with his flute the maidens of India; yet when Apollo had invented the lyre, Marsyas in vain tried to charm mankind, even with Minerva's own pipes; for then not only were the feet free to join in the dance, but the mouth was also set free to add voice to the

charms of instrumental music; and though some, like Midas, remained true to the older form of instrument, the very reeds conspired together to announce to the world, "Midas hath ass's ears," and when Orpheus arose, the very rocks and woods, beasts of the field, and birds of the air, were powerless to resist his song accompanied by the perfected lyre; nevertheless, the pipe has not even yet quite lost its power, for to the present day ~~X~~ the dreaded cobra is called from his hole and made to dance to the music of the Indian pipe; and children, even as in the days of the Pied Piper of Hamelin, will swarm at the heels of the travelling performer on the bagpipe; though the rats have grown wiser, warned perhaps by the tradition handed down by their gray-beards, of the fate of their brethren; and like the deaf adder, they refuse to hear "the voice of the charmer, ^X charm he never so wisely."

Of the myth of Orpheus I purpose to treat in another chapter, for it is inseparable from the lyre, which ushers in the third great step in the musical history of the ancient world. Suffice it here to say, that there still remain Arcadias, where dusky beauties dance to the sound of the primitive syrinx of Pan, or to that singular variety, the nose flute, and where Orpheus and his lyre are all unknown, for the lyre would seem to have been confined to the Eastern hemisphere, and not to have penetrated to America and the Oceanic Isles until introduced by Europeans; and stringed instruments are still wanting in many groups of the Pacific Islands. It seems strange that the civilized Mexicans and Peruvians should not have possessed stringed instruments, especially as they had so many other things in common with China and Japan; and we cannot help thinking it probable that some sort of lute or harp will be found to have been in use among them, although they seem to have given the preference to instruments of percussion, and to those of the inflatile type. Catlin mentions lutes as in use among the North American Indians; but Mr. Rowbotham refuses to believe in the existence of that which would rather militate against

his theory of the succession of musical instruments, and which affirms that should one of the three kinds be rejected, it is always the drum or the flute, and never the lyre. It is, however, certain, that hitherto stringed instruments have not been found among the ancient relics of America, although Engel tells us that the Peruvians had a lyre of five or seven strings.

NOTE.—In the *Journal of the Anthropological Institute* for November 1890 is an interesting article upon the old British “Pibcorn,” or “Hornpipe,” compared with hornpipes and bagpipes from the Grecian Archipelago, Arab reed-pipes, Deckhan pipes and Hindoo hornpipes, giving illustrations of these instruments, and quotations from Chaucer, Spenser, and other early poets, showing the ancient use of the pibcorn, cornpipe, or hornpipe, in Great Britain.

CHAPTER XVIII.

PRIMITIVE INSTRUMENTS OF MUSIC.

III. THE LYRE.

Traditional Origin of the Lyre—The Tortoise in Asia and America—The Search for Osiris—Transferred to Orpheus—Same Myth in Mexico and Peru—The Lyre in South and West Africa—The Bent Bow the Precursor of the Harp—Egyptian and Assyrian Harps—Old Irish Harp—Semitic Lyre—The Lyre of Apollo—The Shell of the Tortoise imitated in Gourds—The Plectrum in the East—The Vina, or Bina—Strings of the Lyre vary in Number—Pythagorean Lyre—The Three Measures—The Story of Orpheus—Introduced into Britain by the Romans—Tesselated Pavements—Diodorus Siculus and Stonehenge—Sun Dances—Merlin and Amphion—Aldhelm and his Harp—Nero—Troubadours.

“Now strike the golden lyre again,
A louder yet, and yet a louder strain ;
Break his bands of sleep asunder,
And rouse him like a rattling peal of thunder.”

IN these lines Dryden commemorates the effect of the music of Timotheus upon Alexander the Great, as recounted by Dion Chrysostom, Plutarch, and others; for that monarch seems to have been peculiarly susceptible to the charms of music; and Rollin relates that “Antigenides the flutist, at a banquet, fired that prince in such a manner, that, rising from the table like one out of his senses, he catched up his arms, and clashing them to the sound of the flute, was almost ready to charge the guests.” But Timotheus, the great poet and musician of the court of Philip of Macedon, could hardly have influenced Alexander, since he died

about the time of the birth of that monarch ; he was, however, celebrated as the perfecter of the lyre, to which he added four strings.

The mythical history of this instrument, and the power attributed to it, is both curious and interesting. We are told that Hermes, the Prime Minister of Osiris, walking on the banks of the Nile after the inundation, struck his foot against a dead tortoise, dessicated by the sun, and retaining only the sinews and cartilages, which, braced and contracted by the heat, became sonorous, and emitted a musical sound when struck, suggesting to him the idea of forming a musical instrument of the same materials. This legend, somewhat altered, appears in the tale of Homer, the invention being assigned by him to the *Greek Mercury* ; who, having stolen some bulls from Apollo, and hidden them in a cave, and having there found a tortoise and perhaps eaten it, amused himself by stretching across the shell thongs from the hides of the bulls he had stolen, and having thus discovered the musical properties of cords thus stretched over a resonant shell, improved the instrument by adding to it the horns of the bulls, and afterwards presented the lyre thus formed to Apollo, as a peace-offering and indemnification for the theft he had committed.

The early lyre certainly consisted of the shell of a tortoise, and the twisted horns of an antelope, with a piece of wood inserted between them, to which the strings were fastened ; and so much importance was attached to the use of the tortoise-shell, that when wood was substituted for it, the wood was carved to represent the shell. This use of the shell of the tortoise is significant, for the tortoise is a sacred animal, both in the Eastern and Western hemispheres ; and is not only connected with the flood legends of America, but Tezcatlipoca, the Mexican god of music, who ranked next to the Supreme Deity, is said to have brought music from heaven on a bridge of whales and turtles ; and although this could scarcely have had any reference to the *lyre*, which was apparently unknown in Mexico,

the myth is peculiarly interesting from the traces which are found, both there and in Peru, of that widely-spread legend concerning the search for the body of Osiris, which in Greece was transferred to Orpheus, and which is thus alluded to by Milton—

“What could the Muse herself that Orpheus bore,
The Muse herself, for her enchanting son,
Whom universal Nature did lament,
When by the rout that made the hideous roar,
His gory visage down the stream was sent,
Down the swift Hebrus to the Lesbian shore ?”¹

In Mexico, the search was for the body of Quetzalcoatl; in Peru, for one of the Incas; but the myth is evidently the same in origin, and like the various Deluge legends must have been derived from some common source.

Doubtless stringed instruments may have been invented in many different places independently; and in fact there are many known, which would seem to have no connection with the traditional lyre. The most simple of these is one found in South and West Africa, which consists of a bow, tightly strung with a sinew from the back of some wild animal of the goat or deer kind, to one end of which is tied a hollow gourd, which acts as a sounding-board. On the West Coast of Africa the gourd is sometimes replaced by a human skull, doubtless the ghastly record of some slaughtered enemy. This rude instrument would seem to be the precursor of the harp, which, perhaps of all musical instruments, is that which has passed through the greatest variety of form, as may be seen by a reference to the Egyptian and Assyrian sculptures and paintings. In most of these, especially in Egypt, the form of the bent bow is distinctly traceable, and it is a curious fact that in very many of them a human head adorns one of the ends, which ornament was also conspicuous on the old Irish harp, being probably a survival from a time when the harp was simply a strung bow with the skull of a slaughtered enemy as a sounding-board, like that of West Africa.

¹ Lycidas.

The variety of size and form of Egyptian stringed instruments is surprising ; harps, lutes, lyres, tambouras resembling guitars, instruments triangular, oblong and square, with or without stands, but all apparently played with the hand only. Mr. Rowbotham says the number of strings on the great Egyptian harps ranged from ten to eighteen, and on the smaller harps from four to twenty-one, whilst the lute had three or four strings, and the lyre from four to twenty-two. Perhaps the number of strings may not be very accurately delineated, but on many of the instruments they are very numerous. The full Egyptian orchestra, we are told, consisted of twenty harps, eight lutes, five or six lyres, six or seven double pipes, five or six flutes, one or two pipes, two or three tambourines ; whilst Athenæus says, that of the six hundred performers composing the royal orchestra of Ptolemy Philadelphus, half were players of stringed instruments, thirty being harpers. It will be noticed that in this enumeration of the instruments of the Egyptian orchestra, the drum is omitted, and the same may be remarked of the Hebrew instruments in the days of David ; and indeed we do not remember that the drum is even mentioned in the Bible, but it was certainly used in Egypt and Assyria.

Mr. Rowbotham believes that the lyre was of Semitic invention, and was introduced into Egypt by the Semitic shepherds. He says—"A son of Chunmpotep, an Egyptian grandee, had need of some paint to paint his eyes with, which was only to be obtained in a certain region of Palestine, and a family of Semites set off with a supply of the paint, and one of them being a musician, brought his instrument with him, and the Egyptians, who knew only harps and lutes, were for the first time gratified with the sight of a real lyre. This Semitic lyre was merely a battered old square board, of which the top part was hollowed out into a kind of gibbous frame, on which seven strings were strung."¹

We do not know where Mr. Rowbotham found this

¹ Rowbotham's *Hist. of Music.*

story, but there is a figure on a tomb at Beni-Hassan generally supposed to represent a Hebrew, and possibly one of the sons of Jacob, holding a rude lyre, which may perhaps be the one referred to by Mr. Rowbotham, who adds—"By the time of the departure of the Shepherds, *i. e.* at the beginning of the 18th Dynasty, this lyre had become a recognized component of the Egyptian orchestra, although much improved, with ten to twenty-two strings." It is certain that the Egyptians had a great many lyres, and one of them may certainly have been copied from that in the hand of the Semite on the tomb of Beni-Hassan; but we doubt whether this was the earliest known in Egypt, especially when we remember the legend which assigns its invention to Hermes, the Prime Minister of Osiris, respecting which there is an amusing note in Burney's *History of Music*— "The bestowing these inventions upon their divinities by the Pagans is abundantly sufficient, says the Bishop of Gloucester, to prove their high antiquity; for the ancients gave nothing to the gods of whose origin they had any record; but where the memory of the invention was lost, as of seed-corn, wine, writing, music, &c.; then the gods seized the property by that kind of right which gives strays to the lord of the manor."¹

The well-known form of the lyre of Apollo does not appear to have been that of the Egyptian lyre, although some of those depicted have horns attached; but a memory of the original legend seems to linger in Tigré, where the people say they used to procure tortoise-shells from the Red Sea for their lyres, until driven from the coast, and they now supply the place of the shell with a particular kind of gourd, very hard and thin in the bark, which they still carve with a knife into squares and compartments representing the shell of the tortoise.² And Bruce tells

¹ Burney's *Hist. of Music*, p. 354, note.

² I have heard of a peculiar stringed instrument formed of a long, bottle-shaped gourd, to which four strings were attached; this instrument belonged to a Koranna Hottentot woman at the Cape, and was played lying flat across her knees with the hand, but whence she obtained it is not known. The lady, my informant, who saw and heard it, says the owner was very reluctant to show

us that he saw in Abyssinia, lyres, the frames of which were formed of the horns of a kind of goat called Agāzān; but that after fire-arms became common in the province of Tigré, this animal became scarce, and they then made the lyre of a light red wood cut in a spiral form to represent the horns. Lyres of this kind with the spiral horns appear on Hebrew coins attributed to Simon Maccabæus, which are therefore of a much later form than that of the Beni-Hassan tomb.

There is an Assyrian sculpture in the British Museum supposed to represent Hebrew captives playing on lyres; but these lyres are of quite a different form, and the cross-bar of each is ornamented with the head of a duck or goose, which, as well as the myth of the tortoise, seems to connect this instrument with the far East; for in Burmah and India, where we get so many special forms of musical instruments, we find the duck or the goose a sacred animal, and constantly employed in the ornamentation of instruments of music as well as of other things having a sacred character. The stringed instruments of Assyria are numerous, and consist of lyres and harps of various forms; and Engel thinks the lyres were probably played with a small plectrum, which in some cases seems to have been attached to the side of the instrument by a cord, an arrangement which is also seen in one of the Egyptian examples, and is still retained in the Nubian lyre called the Kissar. The plectrum, however, seems to be much more used in the East than in the West; for among the numerous Chinese and Japanese instruments of the guitar type there is scarcely one that is not played with some kind of plectrum, whereas these instruments, as seen in Egyptian and Assyrian sculptures, are always played by hand.

it, but that the tones were caught up by a mocking-bird who used to repeat the twanging sound nightly. At the Indian and Colonial Exhibition there were many complicated native harps and zithers from the West Coast of Africa; but it is difficult to find out how many of these were aboriginal instruments; and certainly all are unknown among the Kaffirs of South Africa, who have only the bow and gourd.

M. Fétis believed that instruments of the violin kind, played with a bow, originated in Europe; but Engel has pointed out that instruments of this kind are known in China, and in other Asiatic countries, and it would seem probable that people who had long used the plectrum would be the first to discover the use of the bow. There is, however, a very ancient instrument known in Wales, and called the *crwth*, which is supposed by many to be the original of the violin.

Before passing on to the legend of Orpheus, so intimately associated with the history of the lyre, we must call attention to a very curious Hindoo stringed instrument known as the Vina, Bina, or Veen; supposed to be of great antiquity. It consists of a bar of black wood with seven wire strings and movable frets, with two hollow gourds affixed to it, one at each end. There are several kinds of this instrument in different parts of India, and it is said to be of divine origin; it is played with two plectra made of wire, one in each hand. One of these instruments was brought over for the Colonial and Indian Exhibition, and attracted a good deal of attention from its singularity. The nearest approach to it seems to be the *Tzetze*, an East African instrument of the Somalis, formed of a carved stick, a gourd and a single string, which has six frets to produce six different tones, being an advance upon the primitive bow. A curious instrument of the harp kind is found also in West Africa; it consists of a piece of wood, to which is attached narrow tongues of wood or iron played by the hand.

To return to the lyre and the legends connected with it. The original lyre invented by Hermes or Mercury, and presented to Apollo the sun-god, seems, as I have before said, to bear both in its form and in its history traces of its Eastern origin; its legendary association with Apollo perhaps recalling a forgotten historical fact, that sun-worshippers from the East brought the instrument to Europe. The number of strings attached to the original lyre has been disputed; but a very early representation of a musical instrument on one of the

Egyptian obelisks shows it with two only; some say the lyre of Mercury had three strings, corresponding with the three Greek seasons, summer, winter, and spring; but almost all the poets describe it as consisting of seven strings.

Although the lyre was the invention of Mercury, it was Apollo who first played upon it with method, using it as an accompaniment to the voice, by which means he came off victor in the musical conflict with Marsyas; but repenting of his cruelty in flaying his hapless opponent, he broke the three strings of which the lyre then consisted, and thus rendered it useless for a time; the Muses afterwards added a fourth string, Linus a fifth, and Orpheus and Thamyris two more, thus completing the heptachord or seven tones, which continued in use till after the time of Pindar, who calls the instrument the seven-tongued lyre.¹ For some time it seems to have been considered an offence to attempt to add to the strings of the lyre; for Rollin tells us that Phrynis of Mitylene having presented himself in some public games at Lacedaemon with a lyre of nine strings, the Ephori would have two of them cut away, only suffering him to choose whether they should be the two highest or the two lowest; and Timotheus would have been treated in the same manner, but perceiving a small statue of Apollo with as many strings upon the lyre as there were upon his, he showed it to the judges, and was allowed to retain them.

There is a curious lyre ascribed to Pythagoras the Zacynthian (figured in the eighth edition of the *Encyclopædia Britannica* from a Roman bas-relief), which resembles a tripod, the strings being stretched between the legs, and the three sets of strings were tuned to the three different modes termed the Doric, the Lydian, and the Phrygian. The legs of the instrument revolved so that the performer could change the measure so rapidly that those who listened would imagine they heard three different performers playing in three different modes, which would not seem to our modern

¹ See *Encyclopædia Britannica*, 8th edition: Article, "Music."

ears particularly commendable ; but these three modes were very famous among the ancients, who relate many instances of the wonderful effects produced by changing the measure.

Galen tells us of some young people who were made frantic by hearing a female performer play on a flute in the Phrygian measure, but were restored by the measure being changed to the Doric ; and a similar story is related by Quintilian.

Of these three measures the Doric was the gravest, the Lydian the highest, and the Phrygian between the two. Of the Lydian, Milton sings—

“ And ever, against eating cares,
Lap me in soft Lydian airs,
Married to immortal verse,
Such as the melting soul may pierce,
In notes with many a winding bout
Of linked sweetness long drawn out
With wanton heed and giddy cunning,
The melting voice through mazes running,
Untwisting all the chains that tie
The hidden soul of Harmony ;
That Orpheus’ self may heave his head
From golden slumber on a bed
Of heaped Elysian flowers, and hear
Such strains as would have won the ear
Of Pluto, to have quite set free
His half-regained Eurydice.”—*L’Allegro*.

These lines bring before us one of the most touching fables of ancient mythology, in which the lyre of the sun-god plays a very important part.

Who does not know the story of Orpheus, the gifted musician and poet, to whom the ancients ascribed many superhuman gifts besides that of music, for he was looked upon as a law-giver, philosopher, and civilizer, who had raised mankind out of a state of barbarism, had introduced the mysteries of Bacchus or Osiris into Greece, and taught the people the art of writing, as well as of magic and divination. These fables doubtless refer to the power of music over the wildest of mankind, for all his triumphs are ascribed to his musical skill. It was by his lyre, the gift of Apollo, that

he caused the Argo to move through the troubled water, entranced the Symplegadæ, and prevented them from crushing the vessel between them. It was by his lyre that he lulled to sleep the Colchian dragon, which guarded the golden fleece, and it was by the same means that he almost rescued his beloved Eurydice from the realm of Pluto. *Almost*, for there are bounds even to the power of music; and the lyre which could entrance the rocks, and lull to sleep the watchful Cerberus, could not restrain his own impatience, the fatal backward glance which ruined his hopes, became a source of unavailing and persistent lamentation, till the Thracian women, enraged at his insensibility to their charms, and his constant cry for Eurydice, tore him to pieces in their wrath. His limbs were collected by the Muses and buried at the foot of Mount Olympus, where the nightingale sang sweetly over his grave; his head was thrown into the Hebrus, and still articulating Eurydice, floated to Lesbos, where it was buried.

“ What could the Muse herself that Orpheus bore,
The Muse herself, for her enchanting son,
Whom universal nature did lament,
When, by the rout that made the hideous roar,
His gory visage down the stream was sent,
Down the swift Hebrus to the Lesbian shore ? ”

Lycidas.

The lyre, of which so many marvels were related, was transported to the heavens, and formed into a constellation by Jupiter at the intercession of Apollo and the Muses, and there it shines to the present day, the principal star therein, Vega, being one of the brightest in the northern hemisphere, perhaps the leader in that poetical but silent choir wherein the ancients heard the music of the spheres; and as we see it rise night after night, may we not dream that from that bright and starry world the constant eye of the great musician still looks down penetrating even into Hades in search of his lost Eurydice? There, too, close to the lyre may be seen the swan, the favourite bird of Apollo, transferred like the lyre to the starry spheres, and supposed

to represent Orpheus himself, flying with outstretched wings towards the enchanted lyre, as though by this proximity the Greek astronomers meant to signify that music and song should endure for ever; and that even in the spirit world, the sound of the lyre should have power to attract those kindred spirits which in this life had moved in obedience to the laws of divine harmony.

The story of Orpheus seems to have been much appreciated by the Romans, and by them it was introduced into Britain, of which we have many proofs in those beautiful mosaic pavements which have been found from time to time, several of which represent Apollo or Orpheus, for they seem to have been frequently regarded as the same—playing on the lyre, whilst beasts and birds walk in concentric circles round the seated musician, tamed by the mighty power of music. A very fine pavement of this kind was discovered at Cirencester some years since, and one almost identical at Newton St. Loe; but in one, Apollo crowned with laurel forms the central figure; whilst at Newton, it is undoubtedly Orpheus wearing a Phrygian cap instead of a laurel wreath; and singularly enough, a dog or a fox is represented as touching the lyre, evidently under the guidance of the master.

Undoubtedly this myth of Orpheus and his lyre was well understood by the early Britons; for although as a nation we are now reproached as wanting in musical feeling, there was a time when the very reverse was the case; for this island, according to tradition, was especially dedicated to Apollo; his mother, Latona, having been born here; and Diodorus Siculus says—"Therefore Apollo is worshipped in preference to any other deity, and because the inhabitants celebrate him daily with continued songs of praise, and pay him the highest honours, they are considered as the priests of Apollo, to whom a magnificent *precinct* is allotted, and a remarkable temple of a round form, and adorned with many votive offerings. The adjoining city is also dedicated to this deity; many of its inhabitants are musicians, who, striking up their harps within the temple, chaunt

sacred hymns to their god, and honourably extol his actions." This temple is always supposed to refer to Stonehenge, and in the name of the adjoining town, Amesbury, may probably be traced the *Amber stones* which in Egypt and elsewhere were always so named as dedicated to the sun. Circular temples everywhere were erected in honour of the sun-god, who, under the name of Bel, Baal, or Belenus, was worshipped from Syria to Ultima Thule, and to whom fires were burnt, and dances and songs celebrated at midsummer.

The dances held in honour of the solar deity were represented in early Christian times by those dances round the Maypole, which were the delight of our ancestors, and which supplanted those more ancient ring dances, which have in all times and all countries accompanied sun-worship. Mr. Barnes, the Dorsetshire poet, in an article in *Macmillan's Magazine*, published some years since, pointed out "that a note on the *Pindar of Benedictus* (1620), says that the dancers of the lyric song-dance took one turn (strophe) from right to left with the sun, and then a return (antistrophe), from the left to the right with the planets from west to east, while the epode was sung in a stationary posture answering to the steadfastness of the earth."¹ Stonehenge, and many other circles not only in this country but even in America, are known by some name connecting them with a dance; and we must not forget that to Merlin, our British Orpheus, magician, musician, poet, and lawgiver, is ascribed the conveyance by magic art of the Giant's Dance from the hill of Tara, Ireland, to Stonehenge, a feat rivalling that of Amphion, by whose lyre the seven gates of Thebes were raised, one to each string. Engel, indeed, supposes that this poetic fable means only that men were roused to enthusiasm, and made to work willingly whilst listening to the music of the lyre, accompanied doubtless by songs recounting the noble deeds of great men of old, which may apply also to the fabled power of Merlin. Although it would seem a difficult task in those

¹ 'Rariora of Old Poetry,' *Macmillan's Magazine*, May 1863.

remote times to convey the stones of Stonehenge across the ocean, we must bear in mind that the legend does not apply to the huge outer monoliths of that famous circle, but to the smaller inner circle of stones certainly foreign to Salisbury Plain.

It was undoubtedly the custom in ancient times for bards to wander from city to city singing to their lyre improvised tales of warlike prowess, or of love and romance. Thus wandered Homer, singing of

“Achilles' wrath, to Greece the direful spring
Of woes unnumbered.”

And thus did he inspire the youth of Greece to that emulation of the deeds of their ancestors which culminated at Marathon.

Many a predecessor probably had Homer in civilized Greece, and many a fellow-bard in uncivilized Britain, who for lack of the power of committing their lays to writing, have perished from the memory of mankind. The bards of ancient Britain were far-famed, and formed a class apart. Two or three of the names of these ancient bards have floated down to us connected with verses which may or may not have been of their composing. Merlin in England, Taliesen in Wales, Ossian in Scotland, have been the traditional Homers of their respective countries; and the harp, emblematic of Ireland, testifies to the pre-eminence of the sister isle in the art of music, an art which, if there is any groundwork of truth in tradition, may have been derived with the harp itself from Greece, for antiquaries are agreed that the Tuatha de Dannans of Irish tradition came from the Mediterranean.

The first historical follower of Orpheus in this country was Aldhelm, the founder, or part founder, of Malmesbury Abbey, A.D. 709, of whom it is related, that finding the people given to wild and lawless lives, he seated himself, harp in hand, on a bridge spanning the river Avon, and attracting the people by his music as they entered the town, led them gradually to a better and more peaceful mode of life.

